Compliments
of
[illegible]

I. C. III. 2

32 A 169

Digitized by the Internet Archive
in 2025

https://archive.org/details/tenlawsofhealtho0000jrbl

THE TEN LAWS OF HEALTH.

THE

TEN LAWS OF HEALTH;

OR,

HOW DISEASE IS PRODUCED

AND

CAN BE PREVENTED.

BY

J. R. BLACK, M.D.

PHILADELPHIA:
J. B. LIPPINCOTT & CO.
1872.

Entered according to Act of Congress, in the year 1872, by
J. R. BLACK, M.D.,
In the Office of the Librarian of Congress at Washington.

BOSTON MEDICAL
OCT 22 1917
LIBRARY

PREFACE.

To prevent disease, the first necessity is to know what produces it. It is the business of the physician to understand what are the causes of disease, and he ought, therefore, to be the most capable of directing how they can be avoided. Very many persons, evidently impressed with this view, are in the habit of complaining that physicians do not endeavor to instruct their fellow-beings as they ought, in reference to the preservation of health. While it is true that nearly all the popular books on the subject of health have been written by those whose knowledge of disease is mainly theoretical, yet in the accumulation of sanitary knowledge physicians have been the only contributors. Especially in recent times and in every part of the world have they been investigating, with great care, the causes which produce disease, and the conditions which prevent it. On these topics, their literature contains an immense accumulation of facts, and of a value to humanity almost immeasurable.

By the light of these collected facts, and the conclusions they are capable of establishing, all uncertainty in reference to the preventability of nearly every form of disease must disappear, and the laws pertaining to health be capable of definite settlement; so that men and women, by living accordantly with them, may live as they ought to live, free from disease, and die as they ought to die, from old age, and not by the violent and unnatural process of disease.

In the endeavor to arrange the laws of health into a code, it is, of course, necessary to consider all the ways and means by which health is destroyed, and all the ways and means by which it can be preserved. In no other way can any one be fully informed how to use himself without detriment under all circumstances, and in no other way can a book assuming to be a guide to health, lay claim to the title of complete.

It has also been an object in these pages to impress upon the mind of the reader the degree of importance which should be attached to the various ways in which health is destroyed. This is the more needful, as many persons are seen giving the strictest attention to some things which have very little influence over health, while others of the greatest importance are either overlooked or neglected. A very correct estimate of the relative importance of the laws of health may be obtained by taking them in the order in which they are herein arranged.

The thought will readily occur to every reflective person, that though man is more than ever the monarch of the earth, saying to the forces of nature, "Do this," and it is done, he is himself a poor, weak, sickly, suffering, short-lived being. He has displayed the immensity of his resources in making nature pliant to his will, but only the poverty of his resources in overcoming the causes of the numerous evils which torment his own body. Firm in the conviction that he has the same power for progress and for good over himself as he has over external nature, even to the entire eradication of disease, I offer this work as a small contribution to an end so great.

CONTENTS.

DISEASE:

WHY IT ARISES; WITH SOME CONSIDERATIONS IN REFERENCE TO ITS PREVENTABILITY.

PAGE

Physicians the Strongest Believers in the Preventability of Disease.—Opinions of Savages as to the Causes of Disease.—Prevailing Opinions as to the Causes.—Progress of Knowledge among Physicians as to the Causes of Disease.—Nature not Accountable for Disease.—Other Considerations which make Physicians Strong Believers in the Preventability of Diseaes.—Why Man is the most Sickly of Beings 13

FIRST LAW.

BREATHING A PURE AIR—VIOLATION AND RESULTS.

Pure Air the Natural Food of the Lungs.—Effects of Air Movement on Lung Food.—Results of Defeating a Purpose of Nature.—Gaining Strength by Good Food for the Lungs.—Universality of Lung Starvation.—How rapidly the Body corrupts Air.—Size of Bedrooms in Relation to Health.—Effects of Impure Air on Animals.—Importance of Oxygen to the Blood.—Impure Air and Infant Mortality.—Popular Dread of Ventilation.—Danger of breathing Air slightly Impure.—Cause of Consumption.—Brain-Dropsy, how Produced.—About Children taking Cold.—Other Sources of In-door Air Impurity.—Sources of Bad Air in Cities.—Its Effects.—Why Some are always taking Cold.—All Diseases Aggravated by Impure Air.—A Common Mistake about Impure Air 30

MODE OF OBSERVING THE FIRST LAW.

PAGE

The Sentinel of Danger to the Lungs.—How the Sentinel is Stupefied.—How to keep House-Air Pure.—Ventilation, what it means.—Cause of Catarrh in the Head.—Right Kind of Fireplace.—Removal of Sewage.—Wet and Dry Methods.—Popular Mistake in Reference to Impure Air.—The Best Way of Securing Pure Air in an Impure Locality.—Sure Way of Preventing Consumption . 61

SECOND LAW.

ADEQUATE AND WHOLESOME FOOD AND DRINK—VIOLATION AND RESULTS.

Epicurean Pleasures.—What leads to Over-eating.—Cause of Dyspepsia.—Cause of Decaying Teeth.—Costiveness, its Cause.—Biliousness.—Two Purposes of Food.—Cause of Dizziness, Apoplexy, Boils, and Skin Eruptions.—What produces Bilious Vomiting and Bilious Fever.—Kind of Food which produces a Bilious Complexion and a Pimply Skin.—Limited Supply of Food sometimes promotes Health.—Test of what constitutes Sufficient Nourishment.—Test of what constitutes Insufficient Nourishment.—Cause of Rickets, Hip-Joint Disease, and White Swelling.—What renders Food unwholesome.—What should be the Object in preparing Food.—Why some have always had Weak Stomachs.—What is Good and what is Bad Cooking.—Unripe Food under some Circumstances Wholesome, under others Unwholesome.—Three Diseases Arising from Diseased Food.—Hasty Eating.—Only Natural Drink.—Use of Stimulants like Tea, Coffee, and Tobacco.—Mild Stimulation.—Test of Drinks that are Natural and Wholesome, and of those that are not.—Ultimate Design of a Growing Appetite for Strong Drink.—Effects of Tea, Coffee, and Tobacco.—Alcohol in Health.—Alcohol as a Cause of Disease.—Delirium Tremens.—Insanity and Imbecility.—Cause of Hob-Nail Liver.—Brandy for Travelers.—Wholesome Drinks recommended by Quacks.—Effects of Spirit-Drinking on the Future of our Race . 106

MODE OF OBSERVING THE SECOND LAW.

True Standard of Flour Refinement.—Preventing Costiveness.—Use of Concentrated Foods.—How Much to Eat at a Meal.—

PAGE

Gratifying a Desire for Variety.—Summer and Winter Food.—Leading Precept of Good Cookery.—Bread.—Animal Food.—When an Unripe Vegetable Diet is Wholesome.—How and When to Eat.—Nutriment during Infancy.—Wholesome Drink . . 140

THIRD LAW.

ADEQUATE OUT-DOOR EXERCISE—VIOLATION AND RESULTS.

Primary Effects of Insufficient Exercise.—Benefit of Restlessness in Childhood.—Bad Effects of School Confinement.—Cause of Crooked Backs.—Invaluable Time for laying up Health and Strength.—Brain Work required of Children.—Effects of Insufficient Exercise upon the Young.—Neglect of Out-Door Exercise in Adult Life.—An Evil of our Social System.—What makes the Farmer-Boy Outwardly Strong and Inwardly Weak.—Effects of an Exclusive Strain upon Nerve.—Cause of an Early Loss of Beauty.—Main Cause of Great Suffering during Childbirth.—Too little Exercise causes an Untimely Decline of Health and Strength 164

MODE OF OBSERVING THE THIRD LAW.

Allowance of Out-Door Exercise for Children.—Infants, when to be Taken Out.—Proper Division of Time for Brain- and Muscle-Exercise with the Young.—More Sense shown in the Mode of Raising Animals than Children.—Outwardly Strong and Inwardly Weak.—Out-Door Exercise necessary for Young Women.—Out-Door Exercise for the Sedentary 187

FOURTH LAW.

ADEQUATE AND UNCONSTRAINING COVERING FOR THE BODY—VIOLATION AND RESULTS.

Fashion, some of its Results.—The Great Developer of Disease.—Effects of covering and uncovering Parts of the Body.—Whiskers, their Use.—Danger of Insufficient Covering for the Feet.—Baldness, how produced.—Tight Lacing, its Consequences.—Woman not Born to More Suffering than Man.—Effects of Tight Lacing on Offspring.—Corns and Bunions, how produced . . . 202

MODE OF OBSERVING THE FOURTH LAW.

PAGE

Test of Sufficient Clothing.—Clothing for Infants and Children.—Clothing for Adults and the Aged.—Head-Coverings.—Appropriate Clothing.—Securing Lightness and Ease in Clothing.—Covering the Body equally.—No Natural Movement to be Impeded 221

FIFTH LAW.

THE EXERCISE OF THE SEXUAL FUNCTION ONLY FOR, AND NO INTERFERENCE WITH, THE NATURAL COURSE OF REPRODUCTION—VIOLATION AND RESULTS.

Instinctive Use of the Sexual Function.—Consequences of indulging in Animal Pleasure when its End is Impossible.—Consequences of Solitary Indulgence.—Effects of Excessive Use of the Sexual Function during Married Life.—Effects of Promiscuous Cohabitation.—Effects of Abortions 233

MODE OF OBSERVING THE FIFTH LAW.

Age appropriate for the Reproductive Act.—Is Entire Continence proper?—When it is Improper to Exercise the Sexual Function . 252

SIXTH LAW.

A HABITATION IN THE CLIMATE FOR WHICH THE CONSTITUTION OF THE BODY IS ADAPTED—VIOLATION AND RESULTS.

Why a Change of Climate is sometimes Beneficial.—No Race long survives an Extreme Climatic Change.—Acclimating, its Nature and Duration.—Climate modifies the Forms of Disease.—The Diseases which a Change of Climate tends to Produce . . 257

MODE OF OBSERVING THE SIXTH LAW.

How far one may Remove to the North or South without Endangering Health.—A Change of Residence to the East or West does not affect Health.—Rules to be observed in Great Climatic Changes 270

SEVENTH LAW.

PURSUITS WHICH DO NOT CRAMP OR OVERSTRAIN ANY PART OF THE BODY, OR SUBJECT IT TO IRRITATING AND POISONOUS SUBSTANCES —VIOLATION AND RESULTS.

PAGE

Effects of Constraining Occupations.—Diseases resulting from Great Muscular Strain.—Diseases Produced by various Irritating Substances.—Effects of Exposure to Poisonous Substances . . 275

MODE OF OBSERVING THE SEVENTH LAW.

Occupations to be Avoided by those Predisposed to Disease of the Lungs and Brain.—Improper Avocations for those Predisposed to Disease of the Liver and Stomach.—How to Counteract the Injurious Tendencies of Some Pursuits.—Method of Preventing Floating Particles from entering the Lungs.—Precautions against Lead and Mercurial Poisoning 282

EIGHTH LAW.

PERSONAL CLEANLINESS—VIOLATION AND RESULTS.

A Frequent Cause of Rheumatism.—An Unclean, Inactive Skin Predisposes to Disease 289

MODE OF OBSERVING THE EIGHTH LAW.

How frequently Baths should be taken.—The Proper Temperature of Baths.—Best Time for taking the Bath 293

NINTH LAW.

TRANQUIL STATES OF THE MIND, AND ADEQUATE REST AND SLEEP—VIOLATION AND RESULTS.

Bad Effects of an Exclusive Use of the Mind.—The Effects of Disturbed and Excited States of the Mind.—Effects of Insufficient Muscular Rest.—Diseases Produced by Insufficient Sleep.—A Frequent Exciting Cause of Insanity 296

MODE OF OBSERVING THE NINTH LAW.

PAGE

True Way of Preventing a Disturbed and Discontented Mind.—What constitutes Adequate Rest during the First Ten Years of Life.—Time to be Devoted to the Exercise of the Mind.—How long Adults should Sleep 302

TENTH LAW.

NO INTERMARRIAGE OF NEAR BLOOD RELATIONS—VIOLATION AND RESULTS.

Effects of In-and-In-Breeding.—Why the Rule for the Best Animal Reproduction does not apply to Humans.—Why Close-Blood Intermarriages affect Human Offspring unfavorably.—The Imperfections and Diseases arising from Blood Intermarriages . 308

MODE OF OBSERVING THE TENTH LAW.

Some Conditions which affect Close-Blood Intermarriages.—How Distant the Relationship should be to Intermarry . . . 317

INTRODUCTION.

DISEASE—WHY IT ARISES; WITH SOME CONSIDERATIONS IN REFERENCE TO ITS PREVENTABILITY.

THE Royal College of Physicians, of London, in naming and classifying the diseases which prevail among mankind, make the number to be eight hundred and ninety-nine. This does not include the various forms of injury, and a large number of parasites which sometimes infest the human body. The number, large as it is, fails in conveying an adequate idea of the *amount* of sickness which is constantly prevailing throughout the world. Accurate statistics, which alone would convey an idea of it, has not been attempted. Yet, by the method of Dr. Playfair, of Manchester, England, the number annually sick in any given population may be very nearly determined. After careful inquiry, he found that, in a mixed population of all ages, the number of sick bore the proportion to the number of deaths of 28 to 1, or for each death twenty-eight persons are usually sick. The accuracy of this ratio has been confirmed by

other observers.* By this method, if the number of deaths annually in any given town or city be ascertained, and multiplied by twenty-eight, a close approximation to the sick-rate may be obtained. Applying this rule to New York City, it is found that during the year 1866 the whole number sick was seven hundred eighteen thousand and sixty; and in Philadelphia, during the same year, the number was four hundred ninety-two thousand and ninety-six; total for the year, one million two hundred and ten thousand three hundred and fifty-six. It thus appears that a number corresponding to nearly three-fourths of the entire population of these cities are sick during each year. Even if the estimate be reduced to one-half, the aggregate of suffering and of disease annually endured is truly enormous, and sufficiently accounts for the necessity of keeping an army of fifty thousand physicians, in more or less constant employment, throughout the United States, to cure and alleviate.

PHYSICIANS THE STRONGEST BELIEVERS IN THE PREVENTABILITY OF DISEASE.

Is all this suffering and sickness inevitable,—a necessary part of our nature? Medical men, especially those who have given much attention to sanitary science, will emphatically answer *no*, while those outside of the medical profession would very likely

* American Jour. Med. Sci., Oct. 1865.

answer *yes*, or that the greater part of it is inevitable. That there is such a wide difference of opinion on this point scarcely admits of a doubt. The tenor of popular talk about the disease and the death of this one, and that one, is not often that they were preventable. Nor does the language of the popular press, or of ministers in the pulpit, often refer to disease and untimely death as if they were preventable. On the contrary, they are usually spoken of as if they were inevitable, or special visitations of an overruling power. On the other hand, the language of the most eminent medical men displays a wholly different view. The number who have expressed an opinion as to the avoidability of disease, at least to a great extent, is so great, that were a list of their names to be given, it would fill many pages. I will only surprise the reader by the testimony of Dr. Parkes, a man at once eminent and cautious, and regarded by medical men as an authority of the very highest rank. In his work on Hygiene, he says, "that apart from malaria, we hold our health and life almost at will."—Page 538.

The medical reader also meets quite frequently with such positive statements as this: "It is an ascertained fact, that 100,000 individuals perish annually in this country from causes which are easily preventable." (Abstract of a lecture by Prof. Bennett, in the University of Edinburgh. In Nature, No. 108.) By the rule above referred to, and this statement of Prof. Bennett, 2,800,000 persons are sick each year in Great Britain from causes easily preventable.

In reference to malaria, it should be stated that the diseases which are unquestionably produced by it are few in number, while more recent investigations* tend to show that its influence as a cause of disease is not an exception to the power of avoidance which man possesses.

The difference in opinion as to the avoidability of disease undoubtedly depends, to a great degree, upon a difference in knowledge as to its origin. If it is deemed to arise in most instances from causes over which man has no control, the conclusion necessarily follows that it is inevitable; or, if its origin is a perfect mystery, with no prospect of an early solution, the same conclusion will necessarily follow.

OPINIONS OF SAVAGES AS TO THE CAUSES OF DISEASE.

The history of man, in his most degraded and savage state, the world over, shows that he has always referred his diseases to the agency of some spiritual being. As he advanced a little in knowledge, even though his superstition remained, the causes of disease were sometimes referred to a grosser or more material source. Thus, in a newspaper of Buenos Ayres, giving a description of the fearful plague which, in 1871, swept away in a few weeks' time over 20,000 beings, we are told that the populace supposed themselves the victims of a plot

* Oldham on Malaria, and Transactions Amer. Med. Assoc., vol. xviii.

of wholesale poisoning, in which the physicians were interested, and obstinately refused all medical aid. As knowledge still further increased, men ceased to refer their diseases to spiritual sources, and recognized the influence of natural causes, such as erroneous habits and regimen, in their production.

When mankind believed, as they did everywhere in ancient times, and as they do to-day among all savage tribes, that their diseases were produced by demons, evil spirits, and malignant stars, the mode by which they endeavored to cure them harmonized with their ideas of the causes. The offices of priest and physician were united; it being imagined that those who were fitted and consecrated as guides to the spirit should have the care and cure of its inflictions.

PREVAILING OPINIONS AS TO THE CAUSES OF DISEASE.

The advance in the knowledge of an enlightened community of to-day on this subject is of course great; yet, from various causes, it is not what it should be, and far behind that held by our best sanitarians. If I should attempt to define the prevailing opinions upon health and disease, held by the members of an ordinary community, it would be that, aside from diseases arising from intemperance in eating and drinking, they are nearly all the result of exposure to cold. The physician, in his daily rounds, hears such an expression of opinion on every

hand, and as the cause of nearly every disorder. But there are large numbers of persons who think more deeply, and who perceive that other causes than cold must have been instrumental in their production. They have not failed to discern that, so far as exposure to cold is concerned, what will cause disease at one time, will not at another,—that a very slight exposure will sometimes bring on an attack of severe disease, while at another a very great and prolonged exposure is harmless. Perhaps some of these thinkers may have arrived at the conclusion that cold is not necessarily or of itself a cause of disease. They have considered the fact, that when a wave of cold air sweeps over a continent, the chilling air may serve to develop in one an inflammation, in another neuralgia, in a third a cough, in a fourth a fever, in a fifth an attack of rheumatism, while upon a great majority of the inhabitants the cold change, instead of producing disease, produces just an opposite state, —that is, it braces and invigorates the whole body. Now, one of the plainest rules of correct reasoning is, that a cause, in the true meaning of the term, cannot produce opposite effects, or disease of different kinds in some, and improved health in others. The unprofessional thinker having arrived at this conclusion, to what causes can he then refer the production of so much disease? He can only fall back upon some bad habits, or upon the probability of some taint in the blood; or, in other words, upon something upon which he lacks any definite information. Or perhaps he cuts the knot by supposing that sickness is often-

times not the result of any act of ours, but an infliction sent upon us by an overruling power.

It is precisely here that the true physician should come forward with his knowledge to enlighten his fellow-man, by showing that both health and life are held almost at will, and make plain to him the manner and extent of his responsibility for the diseases to which he is subject.

PROGRESS OF KNOWLEDGE AMONG PHYSICIANS AS TO THE CAUSES OF DISEASE.

Before attempting to present some of the considerations that have made physicians very strong believers in the preventability of disease, let us take a glance at the rise and progress of medical knowledge as to the nature and source of human disorders. Previous to the time of Hippocrates, who lived and taught four centuries before the Christian era, diseases were thought to proceed from the anger of the gods, or from the evil influence of bad spirits. Hence, pilgrimages and votive offerings to the gods, the consultation of oracles, astrologers, necromancers, and the intercession of priests, constituted the means upon which reliance was placed for their removal. To Hippocrates is due the honor of separating forever the offices of priest and physician. He clearly saw and taught that diseases have a more gross and material origin, attributing them to the fluxions, ripening and sharpness of the humors in the blood, mainly produced by improper regimen,

and the changes of the seasons. From his time until to-day, physicians in every part of the world have been diligently observing and recording the causes and influences which serve to destroy health and engender the various forms and types of disease. In this search all the modern improvements of science have been brought into requisition. Earth, air, water, electricity, climate, the growth and decomposition of animal and vegetable substances, have been carefully examined. The habits and conditions of life, the uses and abuses to which men and women have subjected their minds and bodies, and the consequences which thence result, have also been carefully observed and recorded. The collection of facts and observations upon these topics has become immense. The student of disease and its causes is truly oppressed and embarrassed by their profusion should he attempt to determine their worth, or to ascertain the lessons they are capable of imparting.

The period seems to have arrived in the study of the causes of some of the most prevalent diseases, in which the need is not particulars, but general deductions,—not more facts, but a more careful use of what we have. A rage for, and a success in, the simple collection of facts, does not constitute true knowledge or genuine progress. The collection may, and often does, perplex by its very unwieldiness. It must be reduced and simplified into as few and positive truths as possible, to enable the mind to handle all the worth it contains with ease and effectiveness.

In refere ce to the production of disease, by far

the most important generalization to be drawn from the mass of facts at hand, is contained in the means through which the average duration of life has, within the past two centuries, been prolonged.

NATURE NOT ACCOUNTABLE FOR DISEASE.

In the search by medical men for the causes which destroy health and life, two distinct fields have been carefully explored: the one in which nature is supposed to be accountable for the production of disease, and the one in which man is supposed to be accountable. The first embraces the various changes and phases of climate, such as the rotation of seasons, the alternations of heat and cold, the fluctuations of atmospheric moisture and electricity, and the growth and decay of animal and vegetable substances; the second, that of man's mode of using himself, the nature and changes of his relations to climate, and various other states and conditions of which he is the originator. Now, after a most diligent search for many years, very few, if any, agents or conditions have been discovered in the field of nature, spontaneously produced, which are *necessarily* causes of disease.* Hence the increase in the average duration of life, from nineteen to thirty-nine years, cannot be attributed to any favorable change in nature (a supposition groundless and utterly improbable), or to the

* The reader will bear in mind that malaria has only a hypothetical existence.

discovery of any agent of disease which nature is supposed spontaneously to produce, and which man has been able successfully to elude. On the other hand, in human misconduct, in many conditions under which men willfully place themselves, unmistakable causes of disease have been found, which, when corrected, have produced an immediate improvement in health, and a great saving in life. In fact, aside from vaccination, every hygienist is aware that the great increase in the average length of human life is alone due to the improved way in which man has used himself, and to the correction of those unfavorable relations and conditions of which he is the originator. The conclusions, therefore, which we are warranted in drawing from the immense collection of facts at our disposal are, that nature is not responsible for our diseases, that man is himself the originator, and that, if he is ever made free from them, it will only be by correcting his own conduct and bringing it into harmony with the conditions for healthy existence. How very little, comparatively, has been accomplished in these respects, how very far separated the every-day conduct is from what it ought to be, or from the standards productive of health, every physician is well aware. If the improvement in health and length of days has resulted from the limited improvements mankind have made in their modes of living, how great are we not warranted in believing the improvement will be when their conduct is brought into much closer harmony with sanitary law! In some things pertaining to the

preservation of health, mankind have not improved, but have rather retrograded. In the means for securing a copious supply of pure water, in the number, excellence, and efficiency of the magnificent sewers of ancient Rome for conveying quickly into the swift Tiber all the filth of that vast city, in the number of splendidly constructed public baths, in which all were free to wash and be clean, no city of to-day will bear any comparison.

OTHER CONSIDERATIONS WHICH MAKE PHYSICIANS STRONG BELIEVERS IN THE PREVENTABILITY OF DISEASE.

These are not the only considerations that throw light upon the origin of disease, and that have aided in producing the conviction that we hold our health and life almost at will. In making a survey of the conditions which underlie human progress, social order, and especially of the means through which man has acquired his great power over the forces of nature, bidding them do this and it is done, there is displayed one great and central truth, viz., that all has been accomplished in and through law. The glimpse of the important law of gravitation, which is said to have occurred to Sir Isaac Newton from the falling of an apple, led him to follow it on to his grand discovery, its universality; and a knowledge of the laws of electricity and magnetism is what has given us the enviable power of using them to convey our wishes, without loss of time, from and to all parts of the earth. In short, look in what direction

we may, to man's greatest social, religious, and physical successes, and it will be perceived that they have one and all been gained through a knowledge of law and by conformity to it. The largest liberty, the greatest security to life and property, the most triumphant command over the forces of nature, all depend upon the guidance of law. For every mode of man's dealings with man there is law; for every mode of his behavior toward his Creator there is law. By obedience to these laws, man is but placing himself in harmony with those of nature; where, as has so often been observed, the reign of law is universal. And, as all man's command, all his powers over the forces of nature, are embraced in his knowledge of law, so when he works in harmony with it, are these forces his servants, and, when he does not work in harmony with law, are they terrible and destructive masters.

IN WHAT RESPECT THERE IS A THEORETICAL AND PRACTICAL LAWLESSNESS.

It seems from this that the instrumentality of law in making man what he is cannot be overrated. All in him that is great, good, wise, and powerful, has been developed and attained by knowing and conforming to certain standards of right, natural, civil, or revealed. Is he, then, governed by law in everything, even as law governs everything by which he is surrounded? As we have seen, there is law for the government of his conduct toward his fellows, to-

ward his Creator; and it is only by knowing law and working with it that he can successfully use and command the forces of nature. Though the range of law in guiding and regulating man's conduct is large, it is not complete; it is not even theoretically universal over all his acts, as it is practically universal over all the acts of nature. There is a gap, and it is a very important one. The place of deficiency—that part of our conduct which is not influenced by law, either theoretically or practically—is in the uses we make of ourselves. Any one, in a popular way of thinking, may use himself as he pleases, so long as in doing so he does not trample on the rights of others. A man, unfortunately, does not feel that he is breaking any law by keeping his body in the overheated, stagnant air of his house; he does not feel that he is breaking any law by eating all he wants of the most highly-refined, rich, and complex food; he does not feel that he is breaking any law by the daily use of stimulants and narcotics; he does not feel that he is breaking any law in adopting any and every mode of fashionable attire; he does not feel that he is breaking any law when bleaching his blood and rendering his body tender by spending nearly all his time in idleness and in dark rooms; he does not feel that he is breaking any law in straining every nerve in business, and in failing to take adequate rest and sleep; nor does he feel that he is breaking any law while in the marital relation should he indulge his sexual desire *ad libitum*. It is true that, after he has gathered wisdom by experience, and suf-

fered not a little by sickness, he becomes convinced that he has not used himself as he ought; or, in other words, that he has broken some law or other of health. What these laws of health are he has no clear conception. He soons learns that *individual* experience can give him on this subject no reliable information. What seems to have injured him does not seem to have injured many others, and thus his mind is left in a maze of doubt and uncertainty. The result is, that each successive generation starts out in life with as little knowledge, and as little attention to the laws of health, as the preceding; every man having to learn for himself, and by dear experience, what is destructive to his health, and what is not.

WHY MAN IS THE MOST SICKLY OF BEINGS.

Now, as has been shown, when the conduct of man is not subject to law, when he neither knows nor strives to be governed by law, either civil, moral, or religious, he becomes the victim to a thousand evils,—the evils of anarchy; so those who neither know nor strive to be governed by law in the uses they make of themselves, become victims to hundreds of evils in the various forms of disease. And this is why man is the most sickly of beings. As there is no such thing as lawlessness in the order of nature, as there is no such thing as lawlessness in the behavior of one man to another without harm, as there is no such thing as lawlessness in our dealings with nature without harm, so there is no such

thing as lawlessness in our modes of dealing with ourselves without harm.

The question may occur to some minds, why the necessity of so much law, and why the necessity that our conduct should always be ruled by it? Simply from the fact that man is—as the Rev. Bushnell maintains—a truly supernatural being; that is, he can act according to natural law, or he can act contrary to natural law. None of the animal creation can do this: their nature is their law,—they cannot do otherwise than conform to it. Upon the very points in which we are lawless, they are not; simply because they cannot. An animal, for instance, cannot heat and render stagnant a few cubic feet of air in which to live; it cannot refine and concentrate its food; it cannot make and use stimulants and narcotics for its nerves; it cannot clothe its body warmly one hour and thinly the next; it cannot deprive its young of exercise and sunlight, nor can it use the sexual instinct, except at stated periods and for its proper end,—reproduction. Because an animal, when unaided by man, cannot do these things, is it almost free from disease; and because, when aided by man to do some of them, is it sometimes sickly like ourselves.

Moreover, man has not, like the animal, an intuitive perception to guide him unerringly and upon the instant to his highest good; he has to find out by experimenting, pondering, and proving, what is for his benefit, and what is for his harm. Through these means he is enabled to arrive at a knowledge of

certain rules or laws, which when followed lead to the one,—when departed from, to the other. This is true not only of all his modes of using himself, but it is true of all his modes of using the forces of nature.

The difference in mode between man and the animal in arriving at some desirable result, may be made plainer by an illustration. The wild goose can fly through the trackless air in a direct line, a thousand miles north or south, to a certain spot, but man can only travel for a like distance in a direct line to a certain place, over a trackless region, by having a knowledge of the laws of magnetism and astronomy, or in brief, of navigation, before he can equal the feat of the wild bird. His manner of arriving at the best way of attaining this desirable result is slow, laborious, and circuitous, compared with the animal's, but it is none the less sure; and, moreover, is capable in the end of a far easier and more diversified attainment. Now, the intellect of man, to attain another kind of desirable result, superior health, strength and vigor, has to travel over a far slower and more circuitous route than the animal. The latter, in its modes of using itself, takes a direct course to these results through its instincts; but man, by slow and painful experiences, must first learn what the laws are to which he must conform, in the modes of using himself, before he can take the short and easy route to superior health and vigor.

How does man arrive at a knowledge of the laws of nature, such as those of astronomy, chemistry, or

philosophy? By experimenting, observing, and comparing. Just so is he able to arrive at the laws which should govern him in the uses he makes of himself. To the observing physician, mankind have been for centuries experimenting with themselves voluntarily; that is, they have used themselves in almost every imaginable manner, and under almost every variety of circumstances; and physicians have been all the while quietly recording and comparing the results. And now we think there are enough of these results from which to deduce the rules or laws by which he ought to complete the government of his actions, and so make him powerful over himself, as he is powerful over nature. These rules or laws for a right mode of living formulated, or reduced to a plain code, and man made aware of their importance, and that disease should be regarded as nothing more nor less than the punishment for his ignorance and the lawlessness of his behavior, there appears no sufficient cause why he may not become the most healthy, instead of the most sickly of beings. He will then have not only a wisdom which can equal if not surpass the accuracy of instinct in discerning what is hurtful to his health and what is not, but he will continue to have, as in the past, important advantages over the animal in some respects: in being able to foresee and provide against danger to his health and life by floods, by famine, by great heat and excessive cold, and by the ability to destroy the germs of disease which may infest the food upon which he subsists.

MEDICAL
OCT 3 1917
LIBRARY

THE TEN LAWS OF HEALTH;

OR,

THE SANITARY DECALOGUE.

FIRST LAW.

BREATHING A PURE AIR.—ITS VIOLATION, AND RESULTS.

TWENTY thousand one hundred and sixteen times every twenty-four hours does the human chest expand and contract so as to draw *air* into the lungs and throw it out again. So essential are these motions and this *air* to life, that to be deprived of one or the other for five minutes, or even less, is sufficient to produce death. A result so quickly fatal suffices to show that the act of breathing is a very important one,—very closely connected with the hidden springs of life.

Recent advancements of science have shown the exact nature of the changes wrought in the air by the act of breathing it, and the effects upon the lungs and blood by respiration. In the first place, in plain language, inspired air is designed to convey to the lungs their natural food, for they consume a part of it just as much as the stomach does bread; and in

the second place, expired air is designed to convey out of the body the foul or impure rinsings from the nine hundred million of air-cells which the lungs contain. What goes into the lungs, or what was designed to go into them, is life-giving; what goes out, is life-destroying. In proof of this, put a mouse in a bottle holding a quantity of air two or three times the animal's own bulk, cork it tight, and in a short time its sides will begin to heave, exhibiting all the signs of great distress, soon expiring in convulsions.

The same effect has been produced upon human beings by the thoughtless or cruel orders of military commanders. One hundred and forty-six soldiers were ordered into a small unventilated hole in Calcutta for a single night. In the morning one hundred and twenty-three of them were corpses, and the majority of the survivors became victims to a putrid fever, of which all died. Calamities almost as great have befallen the overcrowded steerages of slave and emigrant vessels, by the stupid orders of the commanders to close the hatchways in times of danger from the attacks of foes, or from the violence of storms.

Upon an average, about forty hogsheads of air are taken into the lungs every twenty-four hours, and the same amount is thrown out again. Why this large amount, and what is the meaning of inspired air being thrown out after only a moment's contact with the lungs? It means, in nature's own plain and emphatic language, that more than an instant's contact of inspired air with the lungs renders this air unfit any

longer properly to sustain life, and that perfectly pure, fresh air should constantly take the place of that which is tainted, even in the slightest manner. How diligently man labors to prevent his lungs from receiving an unlimited supply of fresh, untainted air, we shall presently see.

EFFECTS OF AIR MOVEMENT ON LUNG FOOD.

Has the reader ever thought upon the remarkable constancy of air movement? *Its great, leading law is motion.* It either rushes with the force of a hurricane, or moves so gently as only to be detected by the hazy dust that moves in a shadow pierced by a sunbeam. A great and beneficent purpose is effected by this never-ending motion. It carries off, and diffuses far and wide, the impure exhalations from man and his operations, and from the beast; and it sweeps away the foul air constantly arising in our streets, courtyards, and alleys, a thousand times a day. Even this is not the only mode nature has of diffusing and rendering harmless the poisonous gases thrown off from living and dead organic bodies. A slower process is that known to chemists as the law of the diffusion of gases into each other. In other words, when air is motionless, or almost so, a pint, or indeed any quantity of a foreign gas, put in one corner of a room, will in time mix itself equally with all the air the room contains.

RESULTS OF DEFEATING A PURPOSE OF NATURE.

Such are the conditions by which we are surrounded so that no harm shall befall us from noxious gases. But man often does his *utmost* to set these conditions at defiance. He builds himself houses, thick, heavy, solid, and as air-tight as ingenuity can devise. It is his study to render the air in his rooms as motionless as possible, and to shut off all communication between the inside and the outside of his house. A small air-leak, from door-joint, window-frame, or infinitesimal crevice, must be instantly remedied. In thus boxing up in his apartments a few cubic feet of air, he thinks himself and those he holds dear fortunate in being shut in from outside purity, where he must inhale the same air again and again. At night he goes into a sleeping-room perhaps not more than eight by ten feet in size, windows down, doors closed, to breathe its four or five hogsheads of air some half a dozen times over before morning. On entering such an apartment from the pure, crisp, outside, morning atmosphere, the foulness is almost overpowering. This foul air is often allowed to remain throughout the day without any means of escape, ready to be rebreathed on the succeeding night. The result is that the lungs are half starved, the blood becomes poisoned, and the occupant gets up in the morning as weary, as languid, and as unrefreshed as when he lay down. He thinks, and the idea is cherished by many regarded as authorities, that his weakness comes from too little eating; so the

morning distaste for food is overcome by savory dishes, or by simply forcing himself to eat far more than his appetite calls for. This only serves to make him feel worse, so he is advised to take wine and stomach bitters; in short, he must eat more to remove his debility, while all the time the point of starvation is in his lungs.

GAINING STRENGTH BY GOOD FOOD FOR THE LUNGS.

Very few seem to realize that the natural food of the lungs is pure air, that they need a constant supply of this wholesome nourishment, and that without it they are starved and the blood poisoned. The languor, lassitude, and disease, of which thousands are daily aware, are seldom imagined to be the result of lung starvation. Strength and energy, it is thought, are only to be gotten through the stomach, and this much-abused organ is goaded with stimulants, whipped up with tonics, and then loaded with sufficient food to support a Hercules. Yet the weakness obstinately remains, and new devices are sought to help the stomach to do more work. Even physicians, in their directions to the sick, very commonly overlook the needs of half-starved lungs. How often are they heard giving the most careful directions about appropriate food for the stomach, but not a word about appropriate food for the lungs!

UNIVERSALITY OF LUNG STARVATION.

In thus keeping a few cubic feet of the same air in our rooms for hour after hour, nature's mode of providing purity is effectually nullified, and her object, in expelling inspired air after a moment's contact with the lungs, rendered void. The mere fact that nature expels inspired air, after it is sullied by only a moment's contact with the lungs, must be accepted as sufficient evidence of its unfitness to sustain life.

Considering the universality of the practice of boxing up in houses a few cubic feet of air in which to live, the assertion may be safely made, that scarcely one per cent. of the human family give their lungs, by day and by night, sufficient nourishment. With the sick it is even worse, for an ever-present fear of taking cold leads to excluding the slightest current from without, as if it were the breath of death. In this way the air of apartments is not only kept exceedingly impure, but thin, weak, and rarefied.

Consider for a moment what is really done by rebreathing breathed air. That which has lost part of its oxygen, and has washed out the impurities of the lungs twice or thrice, is used again and again for the same purpose. It would be thought a great hardship, and a very unclean and disagreeable thing, to wash the body with water that had been used for this purpose but *once before*, or to drink water thrown off from another's stomach, but to breathe their expired air or our own a half-dozen of times, is not thought

to be a very unclean and disagreeable thing. The washing of the body in water is not a vital process, —it would not kill a man if he did not do it for a whole year; but the feeding and the washing out of the lungs by the ingoing and outgoing air, by the act of breathing, cannot be suspended for five minutes without producing death.

HOW RAPIDLY THE BODY CORRUPTS AIR.

According to Dr. Copland, each person, from his lungs and skin, renders three and one-half cubic feet of air impure every minute, or two hundred and ten every hour. Now, there are thousands of unventilated eight-by-ten bedrooms throughout the country, whose entire air contents are vitiated by *one* person in three hours two minutes and fifty-one seconds. This impure air is not equally diffused throughout the room, nor does the breather take one cubic foot after another of the pure, until he has taken all in the room. He cannot throw behind him the tainted air and draw into his lungs only the untainted; but, in its all-but motionless state, he has to take a mixed article, which is always the worst near the body, on the well-established principle that impure air, whether issuing from the person or from excretions, diminishes as the square of distance. The diffusion of gases into each other is not instantaneous, it takes some time; hence around the sleeper the degree of impurity is always greater than at some distance from him.

SIZE OF BEDROOMS IN RELATION TO HEALTH.

Taking into consideration that the air of bedrooms is not always pure to commence with, and that two, and sometimes three, sleep for eight or ten hours in such little holes, the wonder is, not that they should be often ill, but that they should ever be well. On entering such a room, after having been in the pure morning air, the sense of smell without any scientific testsufficiently condemns it, and warns us of its unfitness to sustain healthy life. Yet, such is the influence of custom and of habit, that a lifetime often passes without any thought as to the differences between such an artificially confined and foul house air, and the free, ever-moving purity without, in their relations to health and to disease.

EFFECTS OF IMPURE AIR ON ANIMALS.

Confine any of the domestic animals in air-tight rooms, as small in proportion to their size as the air-tight ones are for man, and they soon become as sickly as their masters. In no small degree does their healthfulness depend upon the superior quality of the air they breathe. In a state of nature, animals are nearly always healthy. In proportion to the injudicious restraint put upon their actions by man do they become sickly. This is the testimony of all those well informed upon this subject, and in no one way is the evidence of injudicious care more clearly shown than in the effects of the bad air they are

sometimes compelled to breathe. In the French army stables, the mortality among army-horses was reduced from 197 per 10,000 in a year to 85 per 10,000 by improved ventilation alone. I have known some farmers to build for their horses close and warm stables, after which "their luck," as they called it, was so bad that they would lose a horse every year or two. A veterinary surgeon once asked me to look at the lungs of a dead horse, which he had just opened, and which had lived for several years in a close, warm stable. A clearer case of consumption no one ever saw. The lungs had several cavities, some large, others small, and throughout the remaining substance innumerable tubercles could be seen and felt.

The most deadly diseases of animal life are originated by artful control, or by removal to climates for which the animal's nature is not adapted. With the view of sheltering, and a saving of food, cattle are often closely housed, with only a stinted allowance of pure air, light, and exercise. Unite these conditions with other unfavorable influences extreme in degree, and there will soon be generated some infectious and destructive disease, that may spread among them far and wide.

IMPORTANCE OF OXYGEN TO THE BLOOD.

For man and for beast, oxygen, to carry on the changes continually going on in every part of the body, is even more constantly needful than bread and

water. It is one of the elements first in rank of life's mystic force; the life of the breath, as without its mixture with every atom of the blood the latter would have no more life-giving power than muddy water. In fact, those who pass into their blood through their stomachs large quantities of nutritious matter, and do not get sufficient oxygen into their lungs to act upon every particle of it, gather in their systems matters which become deleterious, and require to be burnt out by the fire of a fever every now and then. It is in this way that Nature strives to keep the channels of life open, and to rid herself of hurtful matters. The practice of gorging the stomach and starving the lungs is thus almost similar to providing a lamp with a large wick, plenty of oil, but with a small allowance of air, and then expecting it to give a steady, brilliant light. The one cannot be done any more than the other; every atom of oil, and every atom of food, requiring its atom of oxygen, else there will be waste and disorder in both the processes.

Some author has quaintly remarked that when men lived in reed houses, *they were as of oak;* when they lived in oak houses, *they were as of reed.* The men who lived in reed houses had plenty of pure air, day and night, to sweep the foul matters from their lungs; oxygen enough to vivify their blood, knit its cells into firm, muscular fibre, and cause the blood to thrill the millions of fibres into which the nerves divide with exuberant life, and so make mere existence, a joy, and a delight.

But, if the breathing of an impure air is so injurious, the question may be asked, why is health not immediately destroyed? Such is often the case, and quickly, too. Although those habitually breathing confined and impure air may not be made sick immediately, yet they are *not really well;* they feel languid, heavy, peevish, irritable; the head aches, the appetite fails, and it is only the inborn strength of the constitution that throws off the bad feelings and prevents an attack of sickness. How few persons there are who can really and truly say, that *they are perfectly well a whole week at a time!* Yet it is not perceived that this boxing up in houses of a few cubic feet of air, and attempting to feed the lungs and blood with it day after day, is the usual cause.

IMPURE AIR AND INFANT MORTALITY.

It has long been a familiar fact to medical men that children suffer far more than adults from impure air. This can readily be accounted for, when it is taken into consideration that each day children breathe from four to ten thousand times oftener than adults. In proportion to their size they need far more oxygen, and throw off far more bad air from their lungs. The causes of this are,—a more rapid circulation of the blood than in the adult, the relatively larger quantity of food which they consume, its more rapid transformation into blood, and the rapidity with which all the blood changes are effected. Consequently, the needs of children in these respects

being great and urgent, they suffer sooner and more severely by impure air than in maturer life. A child cannot endure the lack of stomach food like an adult, neither can it endure the lack of lung food like an adult. The late Dr. Meredith Reese, of New York, gave much attention to the causes of infant mortality in cities, and his conclusion was, that the ratio of infant mortality in any given locality furnished a true test of the degree of air impurity. In Philadelphia and Baltimore, nearly fifty out of one hundred children die before they reach their fifth year; and in New York City, sixty-one out of a hundred die before reaching this age; so that, were it not for emigration, the latter place would soon be depopulated, "a waste bridged o'er with graves."

All the diseases of infancy are greatly aggravated, or are rendered extremely malignant, by the habitual breathing of impure air. It is the cause, more than any other, of the extreme fatality of infantile diseases: such as cholera morbus, scarlet fever, measles, croup, and convulsions. The skilled physician is well aware that among those who have had pure air day and night there is little to fear, with proper management, from these diseases; while with those who have had impure air, no degree of skill can save more than one-half of those attacked.

Not alone is this starvation of lungs and blood brought about by rebreathing the same air two or three times, but the manner in which air is heated and carried out of our houses, thins and rarefies what is left. The draft up the chimney carries a large

quantity out of a room, while there is no adequate provision for letting more in. So greatly is the air thus thinned that, by every crevice and keyhole, the rush of air from without is as great as if there were a vacuum created within by an air-pump. As a consequence, what is left is so expanded that there is not the amount of oxygen in two inspirations that there ought to be in one.

It is no exaggeration to say that there is not more than one house in a thousand so arranged and managed as to give its occupants a constant supply of strong, wholesome lung nutriment. It must be recollected that the lungs cannot be fed like the stomach, in half an hour, three times a day; they require their food during every minute of life, or about *twenty thousand times* a day. Though it is thus apparent how essential the proper feeding of the lungs is to the continuance of life, it receives less thought and care than any other health-promoting measure.

POPULAR DREAD OF VENTILATION.

How to obtain an abundance of pure water is often an object of solicitude, but it is quite the opposite in reference to an abundant supply of pure air. During the winter, and throughout the night the year round, the endeavor is to change the air of a room as little as possible. Usually, what flows in comes entirely from imperfect carpentry, or the occasional opening of a door, the shrinkage of a window- or door-frame,

or of a floor-joint, just as it happens. The popular belief is, the less admitted the better. The house having the most tight, close-working joints, is an object of admiration and envy. Anything like a gently passing current, which is the *true meaning of ventilation*, is thought to be dangerous, and productive of colds, coughs, and consumption. So all the foulness is carefully kept in, and all the purity kept out. It does not seem to occur to those who have such a dread of air drafts, that domestic animals exposed to all the rigors of our climate, from heat to cold, from dryness to moisture, from rain to frost, wind and snow, day and night, seldom, if ever, have colds, coughs, or consumption. They have not even the power of adapting their protective coverings to the changes of the weather from day to day, or of keeping the chilling raindrops from their skin; yet, except when brought under the artful management of man, they are models of healthful vigor. Confine any of the lower animals in small, dark, close, warm, overcrowded rooms, and otherwise overrule their instincts by art, and, as experience has shown, their diseases will soon become wonderfully human-like in form as well as in frequency.

DANGER OF BREATHING AIR SLIGHTLY IMPURE.

The habitual breathing of even the most moderately fouled air of a house, has a constant tendency to undermine the health and vigor. Aided by other

causes, it is almost certain to do so; the condition of body which it produces rendering what otherwise would have been a very slight affection, a very dangerous one. Any change from ordinary habits, or the occurrence of a trifling accident, serves to disturb the harmony of the system, and to develop consumption or a fever. The blood is in a condition similar to fermentable substances, ready to undergo a kind of decomposition the moment that circumstances favor.

Those who feed their lungs and blood on air more or less made up of the off-scourings from the lungs of others, cannot be strong and healthy. The pale cheek, the lustreless eye, the white lips, the dull, heavy, stupid languor, *tell a different tale.* The clergyman's blue Monday, the scholar's pallor, the teacher's headaches, and the tedious sufferings of thousands very delicately constituted, are the common results of breathing imprisoned, doubled and trebled, second-hand air.

CAUSE OF CONSUMPTION.

One with a constitution not very strong, or unable powerfully to resist conditions unfavorable to health, and with a predisposition to lung disease, will be sure, sooner or later, by partial lung starvation and blood poisoning, and by the defective nutrition which thence ensues, to develop pulmonary consumption. The lack of what is so abundant and so cheap — good, pure air — is unquestionably the one great cause of this terrible disease.

Pages might be filled with the names of medical men, eminent in their profession, who have expressed this opinion; and though physicians, and even many who have not made the causes of disease a study, admit the fact in a general way, yet they seldom seem to think or fully to realize that in their houses, in their schools, in their churches, in their places of business, in their offices, in their railway-cars,—in short, nearly everywhere inside of a house,—do they feed their lungs on the very thinnest and worst kind of food.

In breaking this law of pure air for the lungs, the lungs are the part of the body upon which the weight of the infringement falls. Every one is aware that improper food for the stomach is the ordinary cause of its diseases, but few seem to know that improper food for the lungs is also the ordinary cause of their diseases. And the practice of allowing the lungs only this kind of food is one of the most prevalent habits of civilized life, and diseases of the lungs are its greatest bane and greatest dread. More persons die by consumption than by any other single disease. If there be added to those the large number that perish every year by inflammation of the lungs and bronchial tubes, disease and premature death may be well said to have in these organs their chief citadel. The leading cause of all this undoubtedly is, the poor quality of the food on which the lungs are nurtured. The very best physicians, when their attention is directed to the subject, admit the full force of this conclusion, and that it has not received the attention

it deserves. Prof. Hartshorne remarks on this point, that "the influence of impure air in promoting consumption has probably heretofore been underrated." Dr. Mapother, supported by Dr. McCormac, Dr. Aitken, and other Bristol authorities, regards impure air as one of the chief modes of morbid causation over which sanitary regulations should exert control. The vitiated air of the European barrack system for soldiers, says Prof. Parkes, "is the only way in which the great prevalence of consumption in European armies can be accounted for." This is the conclusion to which the Sanitary Commissioners for the army came in their celebrated report: "A great amount of phthisis (consumption) has prevailed in the most varied stations of the army and in the most beautiful climates,—in Gibraltar, Malta, Ionia, Jamaica, Trinidad, Bermuda, etc., — in all which places the only common condition was the vitiated atmosphere which our barrack system everywhere produced. And, as if to clinch the argument, there has been of late years a most decided decline in phthisis in these stations, while the only circumstance which has notably changed in the time has been the condition of the air."* A very eminent authority, the late Dr. Marshall Hall, of England, said, in reference to pure air in the treatment of consumption, "If I were seriously ill of consumption, I would live out-doors day and night, except in rainy weather or midwinter; then I would sleep in an unplastered log

* Practical Hygiene, page 97.

house. Physic has no nutriment, gaspings for air cannot cure you, monkey capers in a gymnasium cannot cure you, and stimulants cannot cure you. What consumptives want is pure air, not physic,—pure air, not medicated air,—plenty of meat and bread." Let it be remembered, in this connection, that every hygienic or health-promoting measure which tends to cure a disease is much more efficacious in preventing it.

Dr. Grey (Archives of Medicine) gives the following table of lung diseases, based upon measurements of the air capacity of rooms occupied by letter-press printers, and the number of compositors in each:

	NUMBER PER CENT. SPITTING BLOOD.	SUBJECT TO CATARRH.
104 men having less than 500 cubic feet of air to breathe . . .	12·50	12·50
115 men having from 500 to 600 cubic feet of air to breathe . . .	4·35	3·48
101 men having more than 600 cubic feet of air to breathe . . .	3.96	1·98

No doubt many a highly-educated and careful mother, who watches over her daughter's health with anxious solicitude, thinks that she does not starve the lungs of her child; but let her take the estimate of one of the most able and recent writers upon this point,—Prof. Parkes,—who says that "a human being requires two thousand cubic feet of new

air every hour, and that short of this it begins to get poor and poisoned, and therefore unfit to support life in a perfectly healthful manner:" let her then calculate by the dimensions of her daughter's rooms, with the faulty or imperfect ventilation which is almost certain to exist, and it will be found that from her childhood upward she has had nearer two thousand cubic feet per day than two thousand cubic feet per hour. All that time her lungs had been kept on starvation and unwholesome food, and yet wonder is expressed that after the most diligent care, after the most anxious forethought, after a lavish expenditure for everything that could contribute to her comfort and well-being, she takes cold so readily, with a continuous hacking cough, and at last falls into a decline, and perishes by the terrible destroyer.*

BRAIN DROPSY: HOW PRODUCED.

It is well known that consumption is not a common disease among children, even when deprived of good, wholesome air. But a disease, having essentially the same nature, often attacks the membranes of the brain during childhood. Its name, tuberculous meningitis, or dropsy of the brain, indicates its relationship to tubercular disease of the lungs, or

* Since the above was written, Dr. McCormac, Consulting Physician of the Belfast General Hospital, has published a volume, entitled "Consumption and the Breath Rebreathed," in which the same view of its causation is maintained, or that it arises wholly and solely from the inhalation of a vitiated atmosphere.

consumption. It is a disease that runs a more rapid course than the tubercular disease of the adult, and it is also more fatal. Some cases of consumption, it is admitted, are cured, but it is not admitted that any cases of dropsy of the brain recover. Why the tubercles should be deposited in the brain of the child more frequently than in the lungs, is not easy to explain, though it probably arises from the rapid, yet imperfect development which the first-named organ undergoes in childhood. The leading cause is undoubtedly the same in the child as in the adult, —the habitual breathing of an impoverished and impure air. Many most affecting instances of this disease come under the notice of the physician. It usually seizes the most beautiful and promising children,—children with large heads,—and marches straight on to death. The most profound learning, the greatest skill, the most anxious care, are alike useless in averting the fatal issue. Prevention here is everything, skill to cure is nothing.

ABOUT CHILDREN TAKING COLD.

Everywhere there prevails an ill-judged fear about children taking cold. Very many mothers, by their anxiety on this point, are frightened into keeping their children closely housed during cold weather. The results have wrung many a heart with anguish. For the false notions on this subject there is no doubt that physicians are large'y to blame. "What, doctor, is the cause of my child being worse this

morning?" "Oh, he has taken cold, and you must be more careful in the future." Such an answer betrays great carelessness, if not positive ignorance, by the physician. It teaches the mother, who has implicit faith in her physician, to dread the pure air of heaven, to shut quickly every open door, to hang heavy curtains over each window, as if every breath of pure air from without carried with it pestilence and death. With the body weak by too little exercise, and the blood impure by breathing polluted air, no degree of care can save little ones from taking cold. It is those most closely housed that are most subject to colds, and that suffer by them the most severely. Get the blood pure and strong by good lung food, day and night, and from birth to manhood or womanhood, and extraordinary exposure will be required to produce a cold. Even then, the purity and strength of the blood render a cold a small matter, which Nature will remove of herself in a day or two. In carrying out these views in my own household with several children, ranging from ten months up to eighteen years of age, many mothers have expressed great surprise. "What! take your child out on such a day as this!" "What! do you sleep with your bedroom window open all winter?" "Yes, and although the cold of this winter (1872) has been more protracted and severe than usual, not a single child has had a cough or a cold."

BOSTON MEDICAL
OCT 22 1917
LIBRARY

OTHER SOURCES OF INDOOR AIR IMPURITY.

The matters exhaled from the body are not the only means of rendering air unfit to respire in air-tight apartments. Gas-lights and lamps consume oxygen, and give off carbonic acid and carbonic oxide; these, of course, in proportion to the number and size. To one aware of the poisonous quality of these gases, it is fearful to think that the rooms most brilliantly lighted are the most crowded with human beings, collected and flitting like moths in an atmosphere abounding in such deadly qualities for hour after hour, as unconscious of harm as the winged insect which dashes in the flame. The languor and headache which follow are attributed to the excitement or to the supper, and many a one dates a continued indisposition from such an occasion, that ends only with life itself.

Another source of air pollution in houses is found in unclean floors, carpets, and cellars. Small but numerous particles of organic matter are frequently moistened and dried, the drying process lifting with the vapor into the air of the room the impure gases which are thrown off by decomposition. Nor must unclean bedding and cast-off clothing be forgotten. Usually saturated with the foul exhalations from the body, they add, if not promptly cleansed or thoroughly aired, in a very large degree to the impure quality of the lung food commonly found in human abodes.

SOURCES OF BAD AIR IN CITIES.

Extreme and almost universal as is the transgression of this law within dwellings, the evil is still further increased by the artificial impurities communicated to the outside atmosphere By a great collection of food and clothing for human wants, there is quickly gathered around our homes a vast amount of organic matter, which, unless regularly and systematically removed, must soon pass into a state of decomposition. When this occurs, it becomes a constant source of air pollution. In the excreta from the body, and in the garbage and slops from the kitchen, are found matters capable of rapid and offensive decomposition. In the neighborhoods inhabited by the poor of our cities the air is always tainted by the great abundance of those substances around their dwellings. Hence, the atmosphere of such localities never being pure, the opening of a window or door does not admit good air to the occupants of a house. The bad air from without is, of course, made worse when within, until loaded with the most loathsome impurities. In this sickening atmosphere men, women, and children live, move, and breathe; their blood, brain, bodies, and actions partaking of the unnatural conditions by which they are surrounded.

With the blood poorly nourished by oxygen, and thick with degraded matter, it is not possible for the thoughts to be bright, pure, and elevating. The

quality of brain-power is influenced quite as much by bad blood as the quality of bile is from the liver. A vicious soil nurtures vice and crime quite as much as it does disease. The stupid sullenness, the low cunning, and the savage, cowardly passions of the inhabitants of the slums of a city, rest upon a physical or material basis. So also do their diseases. The germs of all infectious disorders introduced among them find a congenial soil. These germs, in passing through their bodies, acquire a power and a malignancy that even the pure and strong are unable, when brought within their influence, to resist. The germs of typhus and typhoid fevers, of cholera, and of smallpox, flourish in such localities like weeds in a hot-bed. They rise, like dust in the atmosphere, and are wafted by the winds into our houses, into our bedrooms, and our lungs. They are the messengers of death to ourselves, our wives, sons, and daughters.

The perfect system of bringing into cities vast quantities of fresh animal and vegetable matters, which must in greater part become putrescent, is not equilibrated by as perfect a system of removal. Hence, there is a constant tendency to an accumulation of decomposing matters in courtyards, privies, drains, alleys, streets, and sewers. From these sources, and from the injurious gases arising from manufacturing establishments, the smoke and gases from innumerable fires, the ammoniacal vapors from stables, and the hindrances to the free motion of the atmosphere by closely-built and lofty houses, are found conditions and impurities sufficient to account for the great prev-

alence of disease in large cities, and for the shorter average duration of life than in the country. Except during very high winds, it is not possible under such conditions, even when the inhabitants are out-of-doors, to obtain good, wholesome food for the lungs. Great as the difficulties are in the way of obtaining this kind of food, they are not insurmountable. It is more from lack of knowledge of this law of health, and from false notions of economy, that so much more attention is given to obtaining good, wholesome food for the stomach than for the lungs. Health is never dear at any price; and were one-tenth part of the brain, blood, and muscle, spent in efforts to secure in cities an abundance of good pure air, and with it health, that is spent in endeavors to remove disease after it has occurred, the gain would be immeasurable.

THE EFFECTS OF THE IMPURE AIR OF CITIES.

We have only to look at the vast numbers who are sick, and the large percentage of mortality, in cities, to be made aware that extraordinary causes are in operation for the destruction of human life.

In New York City during the year 1863, although it was not so sickly as in 1864, a number nearly equal to three-fourths of the entire population were sufferers from sickness, or seven hundred and five thousand two hundred and eighty-eight.* In England,

* Amer. Jour. Med. Sci., vol. l. p. 425.

among an equal number of her people, one hundred and forty die in cities to one hundred in the country; while natural deaths, or deaths from pure old age, are from three to four times more common in the country than in cities, the world over. Indeed, such is the fearful mortality in many of the large cities of the world, especially among the young, that it has been estimated that were the ratio to continue for several generations, and no filling up from without by emigration or by removals from country to city, they would soon be depopulated. In Manchester, England, of every one hundred infants born, fifty-nine die within the year.* Dr. Combe extracted the following statistics from the *Liverpool Albion.* The deaths in that city in 1838 amounted to six thousand and ninety-six. Of this number, three thousand one hundred and sixty-two died during the first five years of life. The same eminent author also states that, about a century ago, "the workhouses of London presented the astounding result of twenty-three deaths in every twenty-four infants under the age of one year."† Dr. Clarke, of Dublin, states that at one time, of the infants born in the hospital, one out of every six died within the first fortnight. This he attributed to the lack of proper ventilation, which he proceeded to remedy with great success; for, after a free circulation of air had been secured, the mortality fell to one in nineteen and a half. Dr. Wilson

* Dr. Bell, Sanitary Com. Report, 1859.

† Churchill on Infants and Children, p. 21.

Jewett says, it is no exaggeration to say that more than half of the children born in cities perish before their tenth birthday. Scarlet fever, measles, convulsions, and cholera infantum destroy children by the hundred every week in all of the larger cities,—diseases which invariably assume a malignant character among those habitually respiring impure air. It is mainly from this cause that, for example, in Boston, in 1855, while the average duration of life was for each individual 12·88 years, for the entire State it was 27·43. Says Dr. Condie, "A residence in large and populous cities has ever been esteemed inimical to health, especially during infancy and childhood." Wallas, whose treatise on diseases was first published in 1710, styles cities "the graves of infants, for here there die upon an average five times the number of quite young children that do in the country." During the year 1867, the number of infants in New York and Brooklyn that died before their first birthday was ten thousand seven hundred and three.

Mr. Farr, the Registrar-General of England, who compared the causes of death in counties and cities of about seven millions of persons, found that deaths from consumption were increased in cities thirty-nine per cent., from typhoid and typhus fevers two hundred and twenty-one per cent., and from epidemic diseases they were double to what they were in the country. Now, these are diseases which medical men everywhere recognize as having for their main cause an impure atmosphere.

WHY SOME ARE ALWAYS TAKING COLD.

If the supply of air which the human lungs need every hour to feed and cleanse them, is impure or impoverished by repeated use, or by vapors arising from collections of decomposing matters upon every side, in courtyards, streets, and alleys, the lungs and blood must partake of this impurity and of this impoverishment. With impure and impoverished blood no one can long maintain his healthfulness. The slightest irregularity of temperature, or the slightest deviation from the most orderly and regular habits, will give rise to derangement. There are few who have not experienced when not quite as well as usual, the extreme readiness with which slight shivering chills are produced. To blame the weather instead of the state of the system for this extreme susceptibility, is contrary to all the rules of sound reasoning. But it is precisely what is commonly done. Headaches, coughs, fevers, pains, are almost universally attributed to taking cold, as it is termed. If the blood were pure, such an effect could not occur, but in an impure state no degree of care can prevent it. No care will prevent the consumptive taking cold, simply because the blood is in such a state that the weight of a hair, so to speak, suffices to derange the harmonious action of the vital affinities. Such sick ones and their friends talk and seem to think that if the taking of colds could only be prevented, they might get well. It is a great delusion. As well think of one sick with hydrophobia

getting well by keeping from him every drop of water, as for the consumptive to recover by preventing the slightest rise and fall of heat or cold. The cause of each is in the body, in the blood; once get rid of this, and a drink of water or exposure to a nipping wind, would only give rise to feelings of healthful exhilaration. Healthy persons, or persons with strong, pure blood, do not take colds, simply because they cannot; they cannot be blown over by every puff of wind, but the weakly or impure are at the mercy of every current.

ALL DISEASES AGGRAVATED BY IMPURE AIR.

Moreover, with those of impure blood, ordinary diseases are sure to become unusually malignant or fatal. Disease is also much more difficult to shake off, and the struggle between life and a tendency to death is frequently so severe that the victim is never afterward as well as before. The uniform experience of medical men is, that the more impure the blood the better suited is it to make an appropriate soil for the strong rooting of the germs of contagious diseases, with which every one is liable now and then to come in contact. Indeed, such germs thrive and never die out where the kind of blood abounds in which they grow and multiply.

A COMMON MISTAKE ABOUT IMPURE AIR.

But the difficulty is to convince most persons that the air they breathe is really impure. In the first

place, they think, because not immediately made sick, that what has just been said does not apply to them; and in the second place, they have the very kind of air to breathe, in houses and out of them, to which they have always been habituated. Hence, they are unable to perceive anything wrong with it. I have already spoken of the mistake of supposing that because an agent does not always produce immediate evil results, it is therefore harmless. A man may eat arsenic, mercury, opium, or drink alcohol, in small quantities for a considerable period, without an immediate attack of disease. So may he indulge in gluttony, in debauchery, or engage in the most severe labor of body or mind for a time, without bringing on disease. When disease will appear depends upon the constitutional strength of the individual, the degree of excess practiced, and the co-operation of other causes. Precisely so is it with breathing foul air. Strong persons will resist the milder influence longer than weak ones; but carry the air-poisoning to an extreme degree, or give it the aid of other causes, and it will speedily prostrate the most vigorous. Furthermore, it always tends to wear out life long before the natural period, making men and women gray, wrinkled, feeble, and lank, as if from great age, while their years ought to bear the signs of prime vigor.

To judge of air purity or impurity from what any one has been used to, is no test at all. One habituated from birth to a close, musty smell in rooms, thinks no more of it than he does of the smell of

an onion; or as if it were a sort of natural quality belonging to a house. So, also, those raised amid pollution in the filthiest quarters of a city, are almost insensible to its impure atmosphere. The Irishwoman in her shanty, who has just scrubbed her floor, feels as if all around her were sweet with cleanliness, and any suggestion that its air betrays a wholly different quality, is repelled with scornful unbelief. The same is true, though in less degree, among those of higher station. The kind of air they have in their houses and around them, is what they have been habituated to; *there is nothing wrong with it.* Yet let them think, for a moment, that the natural state of air is motion, and that the usual mode of constructing houses, especially for night and winter protection, is to make the air in them as motionless or stagnant as possible, and that every hour, besides poisonous animal matter, there is thrown out by the lungs and skin of the occupants—to say nothing of gas-lights—about half an ounce of the deadly carbonic acid gas, and the impossibility of air purity is at once set at rest. But, to refute this charge of impurity, it is urged that their rooms are ventilated. But how? By the chance opening of an outside door during the day, and by having open inside ones during the night. Something is accomplished in this way by the open outside door when the weight of the outside and inside air is different; but the notion that ventilation or a continuous current may be secured by the opening of a door between two tight rooms, is simply absurd.

MODE OF OBSERVING THE FIRST LAW.

The breathing of a perfectly pure air is simply agreeable, without any perceptible odor. This sense of agreeableness brings itself before the mind through the nerves acted upon by respiration. Especially are those aware of this pleasing sensation who have not been habituated to such a quality, or who have given heed, or have cultivated the uses for which the sense of smell was bestowed.

THE SENTINEL OF DANGER TO THE LUNGS.

The nerve of smell is placed at the outpost of the lungs for wise purposes, and one of these unquestionably is, to warn and guard against the entrance of noxious substances. A distinguished German writer upon health, Dr. Riecke, maintains that offensive smells are true warnings against sanitary evils. Had this capacity of the nerve of smell been limited to the substances destructive to life, arising from natural sources, the observation would have been a correct one; but when it is extended so as to embrace all that issues from artificial sources, it is quite the reverse. The odor of prussic and carbonic acids is far from disagreeable, the odor from the tanner's vat and the vapor of slightly-heated brimstone are

intensely offensive; the more agreeable ones acting as quick and deadly poisons, while the disagreeable ones are scarcely, if at all, injurious. Besides, the sense of smell gives no warning when brought in contact with the infectious germs of cholera or of smallpox; but when the air is polluted from any strictly natural source, such as from animal excreta, or from decaying animal or vegetable matters,—all of which act injuriously upon the body,—this sense gives instant warning of harm.

HOW THE SENTINEL OF DANGER TO THE LUNGS IS STUPEFIED.

Yet the arts by which air is artificially rendered more or less injurious to life without a warning sense, do not exercise a tenth part of the injury which the pernicious habit does of enduring naturally offensive odors until the sense of smell becomes so blunted as to be insensible to their presence. By steeping the nerve of the nostrils in any offensive gas for a considerable period, it soon becomes stupefied or paralyzed, so far as that odor is concerned. Hence those who dwell in the slums of a city do not perceive the abominable smells by which they are surrounded. Those who sleep in small, foul, unventilated rooms are not conscious by smell of the impure air they are respiring; and the nostrils of the student in the dissecting-room soon become habituated to the strong odor of decomposing human flesh. The proper sensibility of the

nerve can only be revived by a plentiful application of pure air, when, as in the case of one returning into his bedroom after a short walk in a pure outdoor atmosphere, the close, foul air in which he had slept becomes at once, to the smell, unpleasingly perceptible.

With the great majority of persons there is a thoughtless disregard of the warnings of this sentinel to the lungs and blood. Smell seems to be regarded as an endowment bestowed simply for pleasure, serving to promote no important or vital end. That its main use is to signal danger to internal parts is not duly appreciated. The detection of an offensive odor is thought to be the only bad thing about it; and which, to those habituated to it, is of no subsequent importance. Men even pride themselves on becoming accustomed to offensive odors, and quite enjoy the sight of one whose nerve of smell is not benumbed like their own. Instead of seeking to blunt the sensibilities of this nerve, it should be a study to improve it, as the most delicate and available test of air impurity; far superior, under ordinary circumstances, to the tests of science. In this way, all ordinary atmospheric impurities may be quickly detected; and it is truly remarkable how, by a little attention, this sense can be so improved as to detect instantly even slight impurities to which it had before been insensible. In many houses, by the total neglect of this sense, there is an ever-present *family odor*, produced by some special kind of household impurity, and of which the inmates do

not seem to be aware. To those accustomed to pure air, house odors are always perceptible and disagreeable. This ought to be accepted as sufficient evidence of their unhealthful tendencies; not perhaps of an instant or violent sort, yet enough so to give rise to many sensations of slight discomfort, and producing, when long continued, a state of the body very favorable to the beginning and growth of virulent diseases.

HOW TO KEEP HOUSE AIR PURE.

With this sense upon the alert, the next consideration is, how to remove or destroy the causes of offensive odors in and around human abodes. The great requirement for wholesome in-door air is the most scrupulous cleanliness. No floor, carpet, closet, wall, or vessel should be allowed to become coated or saturated with solutions of animal or vegetable matters, or with these matters themselves, either by crumbs of food, oily liquids, saliva, or with any substance containing the smallest quantity of matter liable to decomposition. It should be a diligent endeavor to keep the air of an occupied or unoccupied room at all times as sweet and as free from harmful odors as that over the green fields. Close, musty odors should be remedied, not only by greater cleanliness, but also by a more thorough and constant ventilation. The beds vacated each morning should have their coverings thrown back, and thoroughly exposed for an hour or two to a *current* of pure air before they

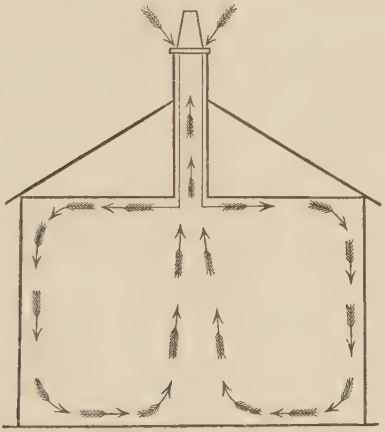
are made up. Closets, and especially presses for cast-off garments, are always repositories of foul animal vapors, needing frequent airing, or, what is better, exposure of their contents to the sun and out-door air. Cellars, besides being kept clean and dry, ought to be frequently opened to currents of air from without, and so kept pure and sweet, for the stagnant air in them is certain to pass through the pores of the floor, and rise into the rooms above.

The exhalations from the lungs and skin of the occupants of a room, furnish by far the worst and the greatest amount of air impurity. This can only be remedied by a constant renewal of air from without. The great and imperative requirement is *air movement, a decided* though *gentle current* through an occupied room *day and night.* In no other way can the air be kept pure, and in a condition at all times fit for the nourishment of the blood. The foolish fear of gentle currents, even when the body is well protected, is very fruitful in mischief. It induces men and women to sit and sleep in close, almost air-tight, apartments, enveloped by an atmosphere deficient in oxygen, every inch of it abounding with the foul and deleterious exhalations from the body. They thus really seem to think that by breathing a weak air they can be kept in strength, and by breathing a corrupted air they can be kept in health.

VENTILATION—WHAT IT MEANS.

The popular idea of what constitutes ventilation is often amusingly absurd. Said a shrewd business-man in answer to remonstrances concerning the lack of ventilation in his sleeping-apartment, "Why, this door and that one," both inside ones, "are left open every night." Said another, and a physician at that, "The door of a room should be frequently swung backward and forward, so as to agitate and change its air." Now, neither of these modes produces a *current* through a room. *Ventilation means running air, just as a river means running water.* The simplest and best way to effect this in temperate seasons is by *two openings* in windows, walls, or doors, one to the windward, the other to the leeward; large in calm, warm weather, and small in cold and windy, but never at any time to be wholly closed. As this mode of ventilation depends upon natural air movement, which is usually in a horizontal direction, the inlets and outlets should be upon a level with that in which the breathing is done. But this mode is not always practicable, on account of the manner in which buildings or rooms are constructed preventing free air from reaching a house, or from there being no possible way of securing a through current. In such cases a tube brought from the house-top, and provided with a cowl, which always turns toward the wind, will overcome the difficulty, provided the weight of the air in the room is not greater than that without. If it is, the tube

will act as an outlet in place of an inlet; a rare occurrence, from the fact that the heat of the body, the



presence of fire, and the warmth communicated to the air of a room by the walls, expand and lighten it. The size of the openings for the entrance of air, of course, depends somewhat upon the rapidity of the current; but, upon an average, an opening of twenty-four square inches is required for the discharge of two thousand cubic feet of air. This is the least quantity which should be furnished for each person per hour. When there are no outside horizontal currents, or next to none,—a rare occurrence,—the motion of the atmosphere is chiefly upward and downward,—very much like that of water heated in a vessel. The ventilating tube will then act as an outlet, and the doors and windows as inlets.

For the ventilation of square rooms, school-rooms,

small halls, or churches, the circular tube of McKinnel (see cut) is admirably adapted. It consists of one cylinder encircling the other, so constructed that both have the same discharge capacity. The outer cylinder admits the air, which is turned up toward the ceiling by a flange. The air then passes along the walls to the floor, ascending near the centre of the room to the inner cylinder, where it is discharged. The current, by this method, is gentle and continuous, though, when the windows are open and large fires built, the tubes will act as outlets.

In *cold weather*, the ventilation produced by the unequal weight of air is the most thorough and convenient. A fire in a room expands and renders its air lighter than that upon the outside. A large amount is also drawn up the chimney, making the weight of the remainder very much less than the air on the outside, which rushes in by every chink and crevice. The amount of air discharged through an ordinary-sized fireplace is about twenty thousand cubic feet per hour, a sufficient outlet for a room occupied by ten persons. Yet rooms with such outlets are often close and oppressive, from the fact that the inlets are insufficient, or that they are badly distributed. If insufficient, the large extraction thins what air is left, and creates so much of a vacuum that the outside air is forced down the chimney in puffs. If badly distributed, as in having the inlet at the bottom of a door or near the floor, the cold air moves rapidly along the floor toward the fire, chilling the feet, and leaving the impure air in the upper part of the room

undisturbed. In cold weather the inlet should always be near the ceiling, and so located as to cause the air to pass across the room before reaching the outlet. In a very large or long room a number of inlets should be provided, and so distributed as to have no part of it without a flow of fresh air. The force of the cold current may be broken by wire gauze, or finely-perforated sheets of tin. When practicable, the air of the inlets may be warmed by having the tubes pass from the outside to the sides or back of a fireplace, or by ranging them in coils and warming by steam or hot water. Upon the former plan, the outside opening for the admission of air should be lower than the inside one, else it may act as an outlet. The air thus warmed should be introduced into the room near to, or upon, the floor, and as far from the opening for its escape as possible.

CAUSE OF CATARRH IN THE HEAD.

The so-called ventilation by basement furnaces is often wholly unworthy of the name, besides being in other respects open to serious objection. First, the air is nearly always overheated,—in fact, baked dry; and secondly, it is minutely charged with the highly poisonous carbonic oxide gas, which, it has been recently shown, exudes from highly heated plates of iron. Then, from the overheating of the air, no possible degree of care will prevent the "taking of colds," as it is termed. Inhaling one minute the air of such rooms, hot and dry as that of the African desert, and

the next minute outside air, cold and damp as that of Greenland, will produce disease in almost any one. It is the main cause of that very common disorder, catarrh in the head. The frequent plunging of the hand into hot and then into cold water, will chafe and irritate even tough skin; and how can it be supposed that frequent plunging of the delicate membrane of the nostrils into very hot, dry air, and then into cold, damp air, should not also irritate and inflame?

Nineteen-twentieths of those suffering from disease, and seeking the advice of a physician, say they have taken cold. From this it would seem, if the taking of cold could be prevented, there would be scarcely any disease. A more prevalent error does not exist. Common observation shows that the men and women most closely and warmly housed suffer the most, not only in simple sensations of discomfort from cold, but from the diseases actually produced by changes of the weather. During the winter season, those who spend nearly all their time in very close and warm rooms, undoubtedly acquire a hot-house tenderness to chilling air, and a liability to suffer much from colds. Dwellings, as a rule, are kept far too warm in winter, a state which could not well exist if they were properly ventilated. The true rule, and one that deserves to be universally adopted for the preservation of health during the winter season, is to *warm dwellings less and clothe the body more.* Compare the warmly-clad, healthy pioneers, with their open, barnlike houses, and the daintily-clad, pale, shivering, sickly beings who live in air-tight, oven-

like rooms, and the former will be found to be very rarely victims to colds,—not a few of them during a long lifetime never needing the services of a physician,—while the latter are seldom without colds, and nearly always feel the need of medical aid.

There is nothing cheaper or more easily obtained than good, pure air; and the idea of having it foul in order to preserve its warmth, is not only sickening, but is, besides, the very worst kind of economy. Health is never dear at any price, and those who will persist in supplying themselves and others with foul, unwholesome food for the lungs and blood, in order to save clothing or fuel, should be made aware that in doing so they are starving and poisoning their blood. They are also the conscious or unconscious agents in producing a thousand uncomfortable and unwell feelings, or in laying the foundation for some unmanageable disease, or some untimely agonizing form of death, with all the attendant sufferings, anxieties, and sorrows.

Finally, it should ever be remembered, that the volume of ventilation in apartments, churches, and school-houses ought to be proportioned to the number of persons, of lights, and of fires in them. Each individual requires at least two thousand cubic feet of new air an hour, or what can ordinarily pass through an opening of a little less than five inches to the side. Over gas-lights, tubes of outlet may be constructed with excellent effect, carrying off not only the products of combustion, but the heated and impure air from below.

THE RIGHT KIND OF FIREPLACE.

In winter, a good large open fire in a room, with an opening near the ceiling for the entrance of fresh air on the side farthest from the fire, will always insure good ventilation. The rooms above may be warmed by the same fire through the hot-air tubes above referred to; always remembering to admit the heated air into the room, near to or upon the floor, and through a register, and to allow the same air to escape by an outlet near the ceiling. For warming large or small rooms, the close stove should never be used. Its use for this purpose, directly or indirectly, causes a great deal of suffering, and deaths by the thousand every year.

THE REMOVAL OF SEWAGE.

How to obviate the manifold sources of out-door air impurity in cities is a most difficult and important question. The vast quantity of animal and vegetable matters brought into them, in a sweet and well-preserved condition, must in greater part remain, or be taken out in a state of offensive putrefaction. Whether as slops, garbage, exhalations from the body, urine, or ordure, each when exposed to a warm atmosphere is deleterious, and as offensive as it is injurious. To allow these remains to lie in alleys, streets, and outhouses, or to saturate the soil with them, is simply to form sure sources of atmospheric pollution. In providing for their transit out of the city by gutter, sewer, or cart, there is a liability to a

greater or less escape of effluvia along the route, as well as a dangerous pollution of the waters into which it is the rule to have them emptied. Worse yet is the habit many have of throwing around kitchen doors, or into alleys, streets, outhouses, and gutters, animal and vegetable substances, or solutions of them, to rot and fester in the sun.

THE WET AND DRY METHODS OF REMOVING SEWAGE.

In disposing of the filth of every description in cities, one of two ways is commonly adopted,—the dry or the hand plan, and the wet or water plan. Circumstances often determine which one should be adopted. Cities well supplied with water, having good grades and a proper débouché for sewage, with sufficient wealth to construct good sewers, should by all means adopt the water plan. Water dilutes, oxidizes, and rapidly conveys the offensive matters to a safe distance before decomposition fairly commences. To aid in securing this removal, the sewers should be flushed daily, or at least on every second or third day.

Well-glazed earthen pipes carefully closed at the joints by a cement of water-lime, make excellent sewers. Their size of course should be proportioned to the amount of sewage to be conveyed, with a fall of at least one to fifty. They are not liable to get out of repair, offer the smallest amount of resistance to a current, and are very durable. It is a very dangerous plan to have the mouths of pipes leading to

the sewer within the house. It is better to have them in a detached building, on account of the liability of the gases to escape into apartments in spite of all the patent contrivances to prevent them. The force of the wind at the mouth of a sewer, and the suction of a fireplace, tend to draw a very insidious foe into our apartments. The danger may be obviated by a branch gas-pipe communicating with the main sewer-pipe, with its open mouth upon the inside of chimney flues in which heated air is constantly ascending. All the pressure of sewer gases is thus removed, and their deleterious qualities destroyed by the great heat of the chimney.

The lack of this precaution, and the consequent escape of sewer gases, was the cause of the recent and dangerous illness of the Prince of Wales, at his residence at Sandringham. The commission appointed to investigate the matter, found that the mouths of the pipes in the Prince's chambers, though partially secured by water-traps, admitted the gases from the cesspool below the house, poisoning all its inmates. Two of the household lost their lives. The royal residence was like an empty vessel, turned upside down, and placed upon an eminence to catch all the gases which rose from the network of sewers below.

In the detached building containing the open communication with the sewer, a perpendicular flue may be constructed, opening when convenient into a chimney, to carry off ascending gases.

The place of discharge of sewage should be, if

possible, into a strong current of water, and below the suburb of a city, to prevent the pollution of the water used by the inhabitants, and the spread of offensive air and fogs around their dwellings. The drains leading from water-closets to the sewer, require to be very carefully constructed, and the pans of the closet provided with a siphon and plenty of water to flush the conduit whenever used.

When the water method in the disposition of sewage is impracticable, or when it is desirable to employ it as a fertilizer, the dry or hand plan may be adopted. The disposal of excreta in open pits or vaults is very little better, in a sanitary point of view, than leaving it upon the surface.

A great variety of agents for destroying the injurious matters in sewage have been proposed. Some are too expensive, others difficult of application, or they destroy its value as a fertilizer, so that, practically, they may be reduced to two,—the application of finely powdered dry earth or sifted coal-ashes. These substances, when properly applied, absorb all offensive gases without destroying the value of the compost. To be effective, however, both require to be perfectly dry and thoroughly pulverized when applied to the excreta. Clayey and marly soils are the best for this purpose, which may be dried in the sun or in a common oven. After being used once, the clay may be re-dried without the escape of any noxious exhalation, and used with the same success three or four times. Coal-ashes is even more available in most regions than clay. It requires to be

carefully sifted, used dry, and but once. A box to contain the dry earth or ashes may be placed above the pan, and the contents sprinkled over the excreta by touching a lever. The pans should be frequently emptied,—a point of some inconvenience,—fully recompensed, however, by the great value of the compound thus formed for enriching poor land.

In all the smaller inland towns and cities, this method presents important advantages over the water method, and should be immediately adopted. Water is not always abundant or of easy access; the construction of sewers is expensive, and a proper place of discharge frequently unattainable. Besides, the excreta deprived of all smell can then be profitably used,—a point of growing importance on account of the systematic exhaustion of the soil by taking largely from it every year and putting nothing back.

A large part of the garbage from the kitchen liable to decomposition may be easily burned, and the liquids rendered harmless by perchloride of iron, twenty grains to the gallon.

Without municipal regulations and conveniences to compel and to incline the inhabitants of towns and cities not to throw around their dwellings any form of animal or vegetable remains, or any liquid whatever, save pure water, the possibility of having pure air day and night need not be entertained. These, with animal excreta, are the prime sources of pestilential vapors: soil, gutter, street, alley, and outhouse reeking with the unwholesome gases arising from their decomposition.

Extensive manufactories, especially those changing the form of animal or vegetable matters, throw off large quantities of gases of various kinds, and should not be allowed to operate near to any human abode. Avarice, next to ignorance, is the worst of all enemies to health, but an enlightened public sentiment could and should compel a complete separation of manufactories from the midst of localities where human beings are collected in great numbers. Better health, a great saving of time, of money, and of anxiety from sickness, and a longer lease of life, would be the result. The nearness of dwellings for laborers to such centres of impurity always proves, in the end, the very worst kind of economy.

A POPULAR MISTAKE IN REFERENCE TO IMPURE AIR.

Let no one be misled by the popular error that because these or any other kind of foul gases do not produce disease immediately, or because persons can live for years in such localities without unusual sickness, therefore air so corrupted is not injurious. It is the exception, not the rule, for disease to be produced in this quick way. It cannot too often be repeated, that the usual mode of action by health-destroying agents, is to operate upon the body slowly, and in a manner that cannot be perceived, whereby its energies are at last prematurely worn out and destroyed. It is precisely with the breathing of impure air as it is with the case of a young man who for years revels in gluttony: boastfully retort-

ing to remonstrances that it does not *hurt him*. But at the very time when he should be in the prime of hale, hearty life, he will be found to be a poor, miserable, broken-down dyspeptic; and yet gluttony did him no harm! So it is with those who habitually breathe impure air. With strong constitutions, they may resist its bad effects for years; but at the very period of life when they ought to be in the full vigor of manhood, they find themselves ruined in constitution, and completely broken down in health; it may be by some severe attack of fever, some chronic disorder, or some malignant disease.

THE BEST WAY OF SECURING PURE AIR IN AN IMPURE LOCALITY.

Municipal authorities are usually very solicitous that an abundance of the best food shall be brought into cities, but are almost indifferent, except when under great fear from pestilence, what kind of food the lungs shall receive. The sources of impure air in compactly built cities are so numerous, that, unless some sweeping and rigorously enforced law effects their removal, the observance of the most enlightened rules for the preservation of health by one or by a few, will not prevent them from becoming infected by the prevailing pollution. A removal to the suburbs is the only proper course to be adopted in such cases; but when this is not practicable, the next precaution best adapted to guard against evil effects, is to observe the following rule. During the day, the rapid motion of the air prevents its great

pollution from local sources, sweeping the foulness away almost as rapidly as it forms; while during the calms of night the lower layers of the atmosphere attain their greatest degree of pollution: therefore select a sleeping-apartment in the highest rooms of a house,—the higher the better,—where the air is the most easily and frequently renewed; keep it open to the day air, and close it carefully against the evening and night air. For one person, this roomful of imprisoned day air cannot be too large, and ought to contain at least four thousand cubic feet, or measure twenty feet in length by twenty in breadth and ten in height, with the bed for the sleeper in the *centre* of the apartment. In cold, frosty, or windy weather, this keeping out of night air need not be practiced, as cold weather arrests for the time organic decomposition.

THE SURE WAY OF PREVENTING CONSUMPTION.

The supreme importance of good, pure lung food for all living beings—the tender infant, the delicate daughter, the robust man, and the old, bowed down with years—cannot be too strongly impressed upon the mind. Pure air is not only the best of all blood purifiers, but it is the best preserver against ill effects from other impurities, and the best of all tonics for weak lungs. The idea, deeply fixed upon the popular mind, that the only way for the weak to gain strength is through eating and drinking, leads to the invention of an endless variety of tempting and over-

nutritious dishes, and to the drenching of the stomach with wine and bitters. The practice is a most disastrous one. Thousands to-day are suffering in this way, or by having their lungs both starved and poisoned, while the stomach is stimulated to its utmost, and gorged with rich aliments day and night. Yet such often remain pale, weak, and thin, and quack doctors urge that more stomach bitters be taken to bring them out. They are also usually carefully housed, and directed to keep away from fresh air, from anything like a current, and are not allowed to take out-door exercise, except on the finest days, and then only for an hour or less each day, for fear of taking cold. Besides, the kind of exercise taken is usually unworthy of the name, for it too often consists simply in sitting quiet, in an easy posture, in an easy carriage. This mode is quite proper for those debilitated by actual disease, but not for the thin, weak, or delicate, who desire to be made strong and healthy. Little by little, and day by day, should out-door exercise be increased, until the body becomes pure enough and strong enough to take care of itself.

If the uniform, half starving of the lungs be long continued, even though the stomach be well supplied, the body gradually becomes weaker and weaker, and paler and paler, in spite of all the stimulants, all the tempting dishes, and all the care which art can devise and affection bestow. And so, in this way, a regular decline in health is established, or consumption developed, all on account of the unfortunate mistake in thinking that colds,

weakness, and consumption can only be prevented by careful housing and rich feeding. Such a system is the very one to cherish and bring on such diseases. It develops them among animals which do not have them in a state of nature. It causes men and women to put large quantities of food into the stomach, which, if digested and carried into the blood, does not receive sufficient oxygen and sunlight to develop its strengthening power. It prevents the taking of exercise, to knit into firm fibre and nerve rich elements in the blood. It causes large quantities of nutritious matter to be arrested in its organization, where it must undergo decay, deranging the healthy action of the entire blood current, and producing active disease in some part of the body, not only from bad nutrition, but from the great labor put upon some organ to expel such hurtful matters from the body.

Perhaps the supreme importance of giving the lungs, day and night, an unlimited supply of pure air, cannot be better impressed upon some minds, than by stating, that after more than twenty years' observation of the causes which produce consumption, and a familiarity with the opinions of the best physicians of the day, I am firmly of the conviction that no one need have any fear of this disease if his lungs are only nourished on good air during every hour of life. The breathing of a pure air a few hours each day will not keep off the terrible destroyer, but the lungs must have this kind of air as often as nature requires it, and this, at the least, is sixteen times every minute.

SECOND LAW.

ADEQUATE AND WHOLESOME FOOD AND DRINK—ITS VIOLATION AND RESULTS.

NEITHER the sufficiency nor the wholesomeness of aliment is a ruling consideration with mankind. Such things are usually left to doctors and to sickly people. To eat as much as possible, and of the most tempting and savory dishes, is the usual rule,—the only question being in the ability to procure them, or in the outlay which they involve. The man or woman who cannot eat of a rich or tempting dish on account of indigestion is common, but the man or woman who will not eat of it from principle is a phenomenon. That the good things of this life were made to be eaten, and the more one gets of them the better, is the grand practical maxim of dietetics among the healthy. The pleasures of the table are not thought of as a means to an end, they are the ends themselves, and the one who can command their unstinted and life-long gratification is deemed among the most fortunate of his race.

EPICUREAN PLEASURES.

The foods and drinks prepared for us by nature are esteemed to be too few and coarse for our over-

refined and pampered taste. Every refinement, every new combination of natural elements, that can add to the sense of deliciousness, is deemed an improvement, and among the evidences of a superior civilization. Indeed, in no one thing is the contrast so marked between civilization and barbarism as in foods and drinks. The barbarian takes his food and drink very much as prepared for him by nature, the man of culture as modified in a thousand ways by art. And this art is directed almost solely to one object,—not to the adequacy or to the wholesomeness of foods or drinks, but to their palatability, to the pleasure they impart, and therefore to the temptation to partake of them immoderately. Nothing pleases a host and hostess more than to see their guests eat with unusual relish, eat long, even to complete satiety. To this end rounds or courses are devised, each succeeding one more and more savory, so as to excite and prolong desire.

Not a little of our boasted civilization is thus a pure sensualism; the ministration to the animal nature by the highest faculty of the mind, or practical Epicureanism, theoretically detested and denied.

Consider for a moment what is the leading and most important feature of an ordinary social gathering. Is it the feast of wit, the flow of soul, the pure and noble discourse upon knowledge, morals, and philosophy? Very far from it. Is it not what the guests shall have to eat and drink? and does not the *éclat* of the occasion depend upon the sumptuousness of the feast? A gathering of any of the inferior

animals for such a purpose might well be considered characteristic of their nature; but for human beings, vaunted as the noble, the godlike, imaging the grandeur of supreme purity, to do this thing, garnished with all the incitements and piquancy which reason can devise, is not this a prostitution of a high gift to a low purpose?

In the United States, over-adequateness, *not* under-adequateness, of food, is the prevailing mode of transgressing this law. The great abundance, richness, and variety of aliments are constant temptations to excess. The tables of the poor are often richly laden, while with those of easier means, they are marvels of concentrated richness. After grinding, sifting, clarifying, boiling, churning, or condensing food material, the richest elements only are selected, to form new compounds; which, though like ambrosia to the taste, often act like thorns to the stomach.

This mode of ministering to the sustenance of the body, experience has shown to be open to the charge of three evils: first, it leads to over-eating; second, to indigestion; and third, to an over-supply of nutritious matters in the blood, which the body cannot convert into flesh, nerve, and bone, or for which there is no possible use.

WHAT LEADS TO OVER-EATING.

First, so long as mankind think more of living to eat, than of eating to live, so long will the prevailing table-fashions remain. Other objects than the grati-

fication of sense must exert an influence before there is an entire harmony of the conduct with the conditions for our well-being. The sufficiency and digestibility of food should be duly considered by all; though such points might be left to inclination, were it not for the artifices employed in preparing food for the table. The art to invent must be met by the art to evade. The concentration, refinement, and great variety of aliments, are designed to tempt the appetite into excess. Whether the amount partaken shall equal or far exceed the necessities of the system, or whether what is partaken shall be of the precise variety of elements needed by the body, are questions about which healthy people take no thought. Hence, when they get sick, when their digestive organs fail, when they have attacks of biliousness, with a dreadful sick headache every now and then, they cannot understand how these disorders arise, but usually suppose them caused by something taken immediately before the attack. Thus, it is only the last straw laid on the camel's back that is taken into account; the weight they have been heaping on for months or years—the main source of the damage, in fact—they think nothing of; and were it not for the occurrence of disease, not even the consciousness of having put on one straw too much would ever be realized.

By the refinement and concentration of food, one spoonful is often made to contain fourfold more nutriment of a certain class or kind than in a state of nature. Yet the same bulk is partaken, or the

stomach filled with one as with the other. The amount and variety of elements, not capable of harmonious digestion, introduced into the stomach, are determined, not by the first feeling of satiety, nor by the second, but by this feeling repeated, as often as there are varieties of tempting dishes on the table.

Not only is there no effort made to control inordinate eating, but every possible incentive is provided to draw the appetite into excess. The variety and richness of tempting dishes placed before hungry Adams by their Eves, are temptations to eat of forbidden fruits not to be resisted; and sooner or later both realize, and to a most intense degree, that there are such things as good and evil.

THE CAUSE OF DYSPEPSIA OR INDIGESTION.

Second, the digestibility of food is rendered difficult not only by the largeness of the quantity, but by the extreme refinement of the quality. Fineness, richness, or concentration, enables food to resist the action of the gastric juice, and therefore to lie upon the stomach two or three times longer than it ought. In such instances, it nearly always undergoes fermentation, impairing the appetite, lessening the strength and energy, and causing frequent eructations of fetid gas and sympathetic headaches. A certain degree of coarseness is essential to easy and quick digestion. Very fine-grained food, like fine-grained clay, cannot readily be penetrated by a liquid; while coarse food, like a porous soil, is penetrated with great rapidity.

The standard of fineness for quick digestion is that which the molar teeth are capable of performing. Compare a grain of wheat thus masticated with finely bolted flour, and the difference is equal to that of coarse sand and the finest puddling clay. Water will almost run through the one, but will stand for hours on the other. Precisely so is it with many forms of refined food and the gastric juice. It cannot penetrate and thoroughly mix with them, so as to dissolve their substance; it can only act upon the outside of the mass, and before the interior is reached it has undergone the sour fermentation. In this way the stomach is overtaxed, irritated, and deranged,—results which, if persisted in, lead to confirmed dyspepsia. With the positiveness of ignorance, very many assert that such foods do not hurt *them*, and hence take no warning, but continue to eat all they can, and the best they can. They forget, if indeed they ever knew, that the reserve strength of the stomach is very much like their reserve possessions. In each a man may spend freely for years without becoming bankrupt, but a profligate use of either will bring bankruptcy at last. The duration of the healthy career depends upon the vital strength inherited, and the frequency and largeness of the expenditure. There is, however this difference; the fortune lost can often be fully regained, but the reserve strength of the stomach seldom, if ever. When its native strength is once broken, it is very much like the break in the native strength of the constitution,—never afterward what it was before. With great

care and proper medical treatment, its angry, irritable state may be subdued; but the slightest draw upon its little remaining reserve energy, is always liable to bring back an intensified renewal of its bankrupt condition, and the violator becomes fully conscious of his folly *only* when it is too late to save. A stomach sufficiently endowed to last with care for seventy years, is often thus worn out in thirty, and ever after the wreck performs its functions with difficulty and pain. It may drag on in this way for years, but never lasts to the period it would have done with proper usage. If it does not wholly fail in itself so as to destroy life, its functions poorly performed, render the entire body weak and frail, liable to be thrown into paroxysms or fixed forms of disease from very trifling causes.

The stomach is the mainstay and support of all parts of the body. Here it is that the manufacture of new blood commences, the pabulum which is to build up and repair the wasting flesh and strength. Let this be poorly done, and if there is a weak spot in the body badly supported, it will soon become the seat of disordered action. With the body as a whole feebly or faultily nourished, exposure to the germs of any contagious disease, or even to unusual hardship, will cause it to yield readily and fatally to their influence. There is no organ of the body so often made to fail in its function, nor so frequently instrumental, through the consequent imperfection in the making up of blood, in giving rise to maladies in other parts. Wipe out its derangements, and the

diseased nervous sympathies which arise from badly-made blood, and half the work for doctors would be wiped out with them. A strong stomach, properly used, is one of the surest guarantees of health and long life,—no centenarian ever having been a confirmed dyspeptic. Yet it is an organ used with the utmost recklessness, mankind commonly regarding it as a mere instrument for ministering to their pleasure, and not as the mainstay of health, strength, and longevity.

Perhaps in no country of the world is the stomach subject to such intense and peculiar abuses as in the United States. The cheapness, abundance, and variety of aliments, aided by an ingenious, pleasure-loving people, have made the stomach of Americans a source of more pain than is probably the case elsewhere. The people of America eat more rich food, in greater variety, and, consequently, are greater sufferers from indigestion than those of any other nation. It has almost passed into a proverb that Americans are a nation of dyspeptics. For a man not to be painfully aware that he has a stomach, is almost unknown. Few, indeed, reach the age of forty without experiencing one or more attacks of indigestion. Even children are frequently victims to it; and so general and extreme are the signs of disease in the digestive canal, that it is something remarkable for young men and women to reach the age of maturity with teeth free from any marks of disease.

THE CAUSE OF DECAYING TEETH.

More than half of the young ladies of to-day are compelled to use artificial teeth. This necessity is a strikingly uniform result of the constant use of a rich and concentrated, and therefore indigestible, food. Under such a habit, the secretions of the mouth are nearly always unhealthy, as is evident on awaking each morning with a bad breath, a bad taste, and a furred tongue. These are but indications of a bad state of the stomach. It is to ascertain the condition of this organ that physicians so constantly examine the state of the tongue and mouth. When the stomach is deranged, the sense of taste is usually deranged with it, and so much derangement is what impairs the nourishment and life of the teeth. When the teeth are bathed in diseased secretions day and night, it is not possible for their nutrition to be perfectly performed. This is what operates so destructively on their health and texture; and has far more to do with their early loss than the effects of mild acids and sweets, about which so much has been said. Savages, and the late slaves of the Southern States, who live upon a natural and simple diet, have excellent and beautiful teeth, which do not ache and decay from disease, but wear out in harmony with other parts of the body.

COSTIVENESS—ITS CAUSE.

The indigestion arising from over-eating is confined to no class and to no age. The man who

performs next to no labor frequently takes more nourishment than the industrious day-laborer. It may not always be as great in bulk, but in its rich concentration of elements it is more nutritious. There is in it nothing of a husky or branny nature; every particle of it is capable of digestion and assimilation. After the stomach digests such food, what is left is so small, soft, and fine, that the bowels scarcely feel its presence. The coarse and rough particles, which do not digest, are the natural stimulus to a healthy and regular action of the bowels. The undue refinement of food takes them all out; and so costiveness, languor, headaches, and piles are the ordinary results. Medicine gives but a transient relief, besides tending to weaken a stomach naturally strong.

In these ways luxurious eating deranges the action of all the digestive organs, deadens the natural energy and spirits, and establishes that most miserable of all conditions, confirmed dyspepsia. The despondency and irritability of the dyspeptic are burdens grievous to be borne. Miserable in his gloom, pleasure is impossible, and from the merest trifles spring mountains of suspicion, hatred, jealousy, and revenge. The contentions, the feuds, the litigations, the quarrels, the enemies, the suicides, and the attacks of sickness that have originated from the indigestion arising from over-eating and improper food, no mortal can tell. Such confidence had Galen in diet for moral reform, that he boasted of being able to reclaim the worst characters by it alone.

BILIOUSNESS—ITS CAUSES.

The evils arising from over-eating, while the stomach remains unimpaired, are of no trifling character. The most common is expressed by the term biliousness. Too much nutriment is introduced into the blood, especially of the carbonaceous or oily sort; it seeks an outlet through the largest gland in the body, the liver, in the form of bile; and by its over-abundance produces the much-talked-of "liver complaint." Sometimes the overloaded ducts and gall-bladder discharge their contents largely into the bowel, overflowing into the stomach, producing what is known as sick headache, with vomitings of gall.

THE TWO PURPOSES WHICH FOOD ACCOMPLISHES.

Two leading objects are effected by the introduction of food into the stomach: the furnishing of fuel for sustaining the heat of the body, and for the growth and repair of waste from the wear of its tissues. The one is chiefly supplied by the oils, fats, and sugar contained in the food; the other by lean animal meat, and various vegetable substances, such as wheat flour, beans, cabbage, etc. The former are usually classed as carbonaceous, and the latter as nitrogenous, or heat- and muscle-making foods. The purely carbonaceous cannot strengthen and repair a muscle, while the nitrogenous cannot generate heat, except at an immense loss of substance in the individual.

It is obvious that man requires in his various states and conditions very different proportions of these two kinds of food. The one who is thinly clad, and exposed to a low temperature, must have the means of replacing the heat that the cold air is continually taking from his body; while the day-laborer, whose muscles are in action from morn till eve, must have a large quantity of material to replace the atoms of matter which are worn out by every movement he performs. Unless these two classes of food are adapted to the needs of the body, the blood and the functions of the various organs cannot long remain in a healthy state. When the blood is made up of matters not in proportion to the needs of the body, or very poor in one class and over-rich in another, the slightest external disturbance serves to develop active disease. People then say they have taken cold, and lament their imprudence, and resolve in future to be more careful. Had their blood, and their various organic parts, been fed or managed as they ought to have been, and so kept pure and strong, they would not take colds, even though exposed to all the rigors of the day and night seasons like the beasts of the field.

Were it not for the errors committed in the preparation of food, the second law would seldom be transgressed by eating more of any kind than what the body needs. Natural taste, when left to itself, and among the productions of nature, selects precisely the kind suitable for the wants of the body. But innumerable devices in cooking food deceive,

excite, and subjugate the natural cravings. Many dishes are made so palatable that the temptation to over-eat is almost irresistible; and when the sense palls in the use of one, a slight modification, some ingenious change of almost the same ingredients, renews desire. Thus it happens that there are large quantities of certain kinds of elements taken into the stomach solely from the pleasure derived in eating. The strong stomach digests them, and there is poured into the blood an unnatural proportion of one class of ingredients, of which there is perhaps already an over-supply. The kind usually in excess is the carbonaceous. To this class belong the sweets, the fats, butter, cream, lard, puddings, and pastry, articles which are capable of being compounded in a great variety of ways, and of a character the surest to lead to excess. These are eaten in about equal amounts by the active and the sedentary, in summer and in winter, in countries having a low and in those having a high temperature. When there is a repugnance, amounting almost to a loathing, of sweets and fats, it is overcome by varying and newly flavoring the combinations into which they are wrought.

Explorers tell us that in the Arctic regions they ate pure blubber and drank oil with the greatest relish and benefit. In these regions the intense cold makes such a draw upon the heat-making power of the body, that the food containing the largest proportion of carbon is the only one that can replace the large consumption. On the other hand, in tropical countries, vegetables, lean animal food cut into strips

and dried in the sun, and acid fruits in great abundance, are what the natives crave and subsist upon, and are, besides, what experience has demonstrated to be the most conducive to health. But by our style of civilization little or no attention is paid to the cravings of nature. From every part of the earth are collected articles of food the most tempting in character, which are eaten because they are fashionable, as well as on account of the enjoyment they afford.

A meal composed of bread, butter, bacon, and sweetmeats has a large preponderance of carbon in it, very well suited for those who spend the day in out-door life during cold weather, but for those closely confined in warm houses, or during the heats of summer, wholly unfitted for the needs of the body. There is far too much carbon in it, hence too much in the blood; and what man so diligently puts into his body, nature just as diligently labors to throw out again. Every now and then she rebels, and by causing a disgust for food, declares she will have no more of it. Oftentimes there is an endeavor to throw out the over-supply by bilious vomiting, or by a diarrhœa, which is nothing more nor less than nature's struggle, every now and then, to get rid of the excess of matters forced upon her.

THE CAUSE OF DIZZINESS, APOPLEXY, BOILS, AND SKIN ERUPTIONS.

The blood, thus becoming over-abundant, thick, and heavy, gives rise to inordinate quantities of bile, to headache, to a heavy, dreamy stupor, to dizziness, to apoplexy, to boils, to skin eruptions, to rheumatism, to gout, and to many other derangements, both painful and dangerous. Disease from an overfed blood is far more common than from an underfed. Direct evidence of this is afforded by the fact that three-fourths of the remedies employed by physicians for the cure of disease are evacuants, or medicines which aid nature in expelling matters from the body, either through the stomach, bowels, kidneys, or skin. There are very few who have not experienced the relief which a purgative affords; and antibilious medicines, especially in the spring, are what the majority of men and women have to resort to, to insure their comfort and well-being. Before taking a medicine of this kind they feel heavy, stupid, sleepy, and languid, the appetite is irregular, the sleep troubled, with oftentimes dull and prolonged headaches. After the medicine expels from the body a large quantity of surplus matters, they feel like new creatures. The physic aids in thinning and equalizing the elements in which the blood was unnaturally rich; hence for a time they feel light, active, cheerful, and buoyant. And so, under a new license, on they go, gathering a fresh surplus, only to go through another and another process of artificial cleaning out;

until finally the very means resorted to for relief in such cases becomes itself a source of serious mischief.

WHAT PRODUCES BILIOUS VOMITING AND BILIOUS FEVER.

When men and women eat during the heats of summer what would be a large allowance in mid-winter for a laboring man, of fat meat, butter, sugar, cream, lard in pies and pastry of various kinds, a great amount of labor is thrown upon the liver and kidneys to expel the superabundant matters from the body. About midsummer the liver is often in this way so overtaxed as to become diseased in its action, giving rise to bilious vomiting, bilious diarrhœa, and bilious fever. Especially is this the case with the Anglo-Saxon who has emigrated to a climate warmer than that for which he has through many generations been fitted, and who besides has not, as those native to the soil have, a proportionately larger and more active liver wherewith to perform a greater amount of functional duty.

THE KIND OF FOOD WHICH PRODUCES A BILIOUS COMPLEXION AND A PIMPLY SKIN.

The over-eating of carbonaceous food is kept up not only by the tempting nature of many of the dishes into which they can be wrought, but also by the force of custom or habit. How often, especially on the first warm days of spring, or during the sultry days of summer, does the appetite loathe

the food prepared for its gratification! There may be, and often is, with this loathing a sense of weakness and hunger,—a longing for something not among the dishes at the repast. Fat meat, bread, butter, highly-sweetened coffee, and lardy pastry, constitute the ordinary routine of food from day to day, and from time out of memory. These must be eaten, or nothing; and so the natural dislike for them is overcome, and a much heartier meal partaken than was at first deemed possible.

Nature's warning of a carbonaceous excess in the blood thus disregarded, and with more added from day to day, no surprise should be excited at the bilious hue of the face, or at the frequent attacks of derangement in the liver. Pale and sallow, with a heavy eye, and tormenting attacks of sick headache, such victims are nearly always wan, weary, and fretful. This bilious hue, oftentimes ornamented by a rough, pimply skin, is accompanied with languor, alternate costiveness and relaxation of the bowels, bad taste in the mouth, decaying teeth, and irregular appetite.

A LIMITED SUPPLY OF FOOD SOMETIMES PROMOTES HEALTH.

Indequateness or a deficiency of food, on this continent at least, is not often a direct cause of disease. The common sentiment, I am aware, is quite the reverse. Concerning the poor, and the diseases to which they are subject, there is scarcely a medical writer who does not enumerate among the most prominent causes a deficiency of nourishing food. That it

is so occasionally, especially with the young, and with seamen, and in some recent and noted instances, as at Andersonville prison, is unquestionably true; yet its frequency and influence in the production of disease, I must think, are in a general way greatly overrated. The observations of army surgeons during the late war do not tend to show that scant rations were of themselves destructive, but, on the contrary, were in some cases promotive of healthfulness. Surgeon Bartwell testifies upon this point as follows: "During the time that the garrison at Nashville was closely besieged, and was on quarter rations,—having to collect the rations at the point of the bayonet,—a condition of good health existed not equaled before or afterward. The hospitals had only old chronic cases. Again, at Chattanooga, after the battle of Chickamauga, when the immense army of Rosecrans depended for supplies on the almost impassable road on Waldron Ridge, when the mules and horses died from starvation, and when it was not uncommon to see our noble, uncomplaining soldiers pick up and parch for their own use the kernels of corn scattered by the mules, one would have supposed that sickness would prevail; but the reports of the division corps and regiments showed the reverse. We do not regard short rations as necessary for the health of the soldier, but we do say that the Army of the Southwest was never in such a high condition of health as when the full ration was not furnished. At Camp Big Springs, where there was a lavish distribution of the full ration, the Sanitary Commissioners filling up

with delicacies and luxuries every chink that might be left, one might imagine that the palmy days of soldiering would furnish a small sick-list. Yet I venture to say that a larger number of men were prostrated by disease than before or afterward." * Says Surgeon Phelps, "It is a fact worthy of note that although these two divisions were compelled to subsist on the very shortest rations, and were almost naked in the midst of winter, and without tents, yet their health was unprecedented, many of the regiments not reporting a single case of sickness on their monthly reports of sick and wounded; while the remaining division, that was in camp near Chattanooga, which was much more liberally supplied, was constantly reporting quite a large sick-list, and the appearance of scorbutic indications."†

TESTS OF SUFFICIENT NOURISHMENT.

A general fact, which cannot fail to harmonize with the knowledge of every observing person, is, that the poor, as a class, foreign as well as domestic, have larger and more robust bodies than the class of easier means, or of those whose tables as a rule overflow with plenteousness. To suppose such a difference to arise from accidental causes would be irrational, and, on a search for them, it will be found that the difference mainly depends upon two causes: first, a great deal

* Memoirs of U. S. Sanitary Commission, page 111.
† Ibid., page 63.

of out-door air and exercise; and second, a severe simplicity in diet. The Irishman raised upon salt and potatoes; the Scotchman, on oatmeal porridge; the German, on cabbage and coarse rye bread; the negro of the Southern States, on corn-meal and pork; the Indian, on wild meat and hominy; and the Chinaman, on rice, present bodies stronger, hardier, and less subject to disease than our more dainty and overfed population. That their food is *not insufficient* for the wants of the body is shown by its *size*, *strength*, and *endurance*. These are better tests than any current notions about too little food; tests, the reliability of which all must acknowledge.

TESTS OF INSUFFICIENT NOURISHMENT.

The genuine effects of insufficient food are, at the onset, gnawing hunger, with a progressing weakness and wasting away of the body. When any of those who subsist on very plain food get sick, with not a sign of starvation on their bodies, and the story is told of the simplicity of their diet, a hasty sympathetic judgment is very apt to conclude that that was its essential cause. The rich, on learning what constitutes the diet of the poor, are often filled with amazement that they can possibly subsist upon it; seemingly for the time forgetful of the fact that the strength and endurance of the poor are, as a rule, much greater than their own, and that the aches, pains, and sickness of the industrious poor man are also, as a rule, less than theirs.

When the mother, habituated to affluence and luxury, learns of sickness among the children of a poor neighbor, she is almost certain to say, "the poor, starved creatures!" But when sickness invades her own home, she wonders how it is that her children are often sick, while those of her poor neighbor, always on the street, ragged, dirty, and hungry, are rugged as little bears. The one, with all the care and attention a mother can bestow, are often sick; while the other, with next to no care and attention, are seldom ill. The frequency with which this difference in the healthfulness of the two classes is observed, has led to the popular notion that dirt on children is actually conducive to health. Apology for lack of cleanliness is often made by quoting this notion of its healthfulness. The secret of the rugged health of the one, is in their simple diet and out-door life; and the secret of the pale, delicate, and sickly aspect of the other, is in the over-abundance of the food partaken, and the indolent in-door life they lead. The scanty, simple mode of living among the poor is, therefore, the main cause of their healthfulness; while the over-abundance of the rich is the main cause of their unhealthfulness. Popular sentiment has it just the other way,—sickness from want, and health from abundance.

Perhaps the use of the word *want* in this connection may be open to misconception. Far be it from me to commit the folly of recommending actual want or starvation as a health-promoting measure. Its genuine effects tend all the other way, by giving

disease a power over the body which it otherwise could not possess. Want, in the sense just used, and in the ordinary one, is in being deprived of some of the most common table luxuries. Those who cannot obtain them are popularly said to be in want. Those families too poor to have tea, coffee, sugar, meat, and butter at every meal—though there may be an abundance of two or three of the coarser and cheaper kinds of food—are, in the opinion of many, in want. So far as health is concerned, this sort of want or deprivation is often a blessing. Thousands of soldiers during the late war found it to be so. The rations furnished them by the government were composed of a few simple and coarse articles. Compared with what their food had been at home, it was thought to be the next thing to starvation. This was the language of complaint in innumerable letters from the soldiers in the field to their friends at home; yet, in the end, it was found that nearly every dyspeptic was cured, and that those whose health had been for years in a very delicate condition, became unusually strong and rugged.

The misfortune, too often, with those who, like the poor, are compelled to live on what is called a scanty diet, and what has served to associate the name of poverty with disease, is, that the habits and surroundings of the poor classes are usually very bad. The house air they breathe is commonly polluted, their bodies are unclean, they are dissolute and vile in conduct, and their bodies are imperfectly shielded from the inclemencies of the seasons. All these are

too often lost sight of in estimating the causes of their sickness; or at least they are overshadowed by the great importance attached to a poor and scanty food.

When the body is really under-fed, as manifested by gauntness and debility, it becomes a ready prey to any hurtful influence to which it may be exposed. Impure air, great heat, intense cold, fatigue, and exposure to contagious or infectious diseases, then have unusual power to derange and destroy vital action. This results from the fact that there is not sufficient *fresh* organic material in the body wherewith to maintain the vital energies. The processes of life in the body do not have a uniform or an upward, but a downward tendency. The blood is then largely composed of matters arising from the wasting away of the flesh,—old, worn out, and weakening; not young, fresh, full of force and energy. The germs of disease introduced into such a current, run riot in the midst of so much degraded and degrading organic matter. The struggle between life and death is one-sided. Disorganization is not opposed by organization, waste by supply, and a downward by an upward series of life changes. Starvation is, therefore, among the most efficient predisposing causes of disease. No one exposed to the germs of disease—no one who wishes to preserve himself from contagion—should ever carry a course of dieting to the point of a waning in the strength and flesh. Enough is a feast; but less than this ever tends to disturb the harmonies of the system, and, in so doing, gives any disease-pro-

ducing agent a power over the body which it otherwise could not possess.

Inadequateness of food is frequently a source of disease among the young. Their rapid growth and restless nature require very large quantities of nutriment. If this is stinted, or composed of an almost unbroken round of the same kind of food, their bodies may and often do not receive what is really essential to the filling up and strengthening of rapidly-growing parts, as well as for replacing the large waste of the body by its ceaseless action. When such is the case, some fault in development, or some incurable disorder, is very apt to arise.

THE CAUSE OF RICKETS, HIP-JOINT DISEASE, AND WHITE SWELLING.

What will admirably nurture the body of an active adult will by no means do the same for a healthy, rapidly-growing child. The bones during childhood, for example, require a larger supply of lime and phosphorus than during adult life. If these materials happen to be nearly all cast aside by improper modes of preparing food, disease of the bones must necessarily arise. Were mankind content to take their food proportioned and combined as it is by nature, and allow their children the liberty of choice, precisely the kind most needed for the body would be selected, and with as much accuracy as the root selects its nutriment from the soil in which it is imbedded. But this is not done. One class of ingre-

dients in food is selected to nurture the body, while another is rejected as wholly unfit for this purpose, simply because not quite so palatable. Take as an illustration the usual mode of preparing the wheat kernel for the table. The outside or branny covering is separated from the inner part of the grain, and rejected as unsuited to nourish and strengthen the body. Yet the inner side of this branny covering is lined with a shell of the phosphates,—the very elements needful for making bone, brain, hair, nail, and skin. These elements are nearly all thrown away, like pearls before swine, while the expanding bones and growing brains of the young are left to suffer and to die from an actual state of starvation. Such, in some instances, is the great lack of these earthy salts in the blood during the period of rapid growth, that children take to eating clay, lime, or chalk, in accordance with the promptings of an underlying instinct, which directs when the mind misdirects. It is almost needless to say that the suffering and deformity so often met with in the young from disease of the bones, are produced by these parts being kept for a long time in a half-starved condition. The deficiency may even commence with the mother, whose blood and milk, though rich enough in the elements which nourish the bones when the growth is completed, are entirely too poor to make several pounds of healthy bone in a short time for a rapidly-growing infant. Rickets, crooked spine, hip-joint disease, white swelling, and various inflammations and ulcerations of the bones, with deformity for life, are some of the ordinary re-

sults. Before any of these diseases appear, the bones may seem large enough in size, but in substance they are poor and weak. Nature struggles along as best she can to do her work well, but a little more confinement than ordinary, a blow, a fall, or a strain, converts healthy action into the flame of disease.

WHAT RENDERS FOOD UNWHOLESOME

In regard to the *wholesomeness* of food, this law is almost universally transgressed in all civilized communities. The leading source of this unwholesomeness, is the ingenious arts which reason has devised to cultivate and minister to the pleasure of the palate. The source next in importance, is the desire, or the necessity, of eating animal and vegetable substances in an unripe, immature, or diseased or decaying condition. The first, as a cause of disease, is by far the most common and influential. It embraces the refinements effected by cookery upon articles of food prepared for us by nature, their concentration, their improper combination, and faulty modes of cooking.

It may be laid down as a rule, that the refinement and concentration of food invariably add to the difficulty of its digestion. By refinement is meant the separation in any article of all the coarser and more unpalatable elements from the finer and more delicious; and by concentration, the reduction of food by heat to a much smaller bulk than it originally possessed. The former, it is almost needless to say, is carried to great perfection, and, in conjunction

with the latter, brings foods into forms and qualities very far removed from their natural state.

The ability to improve the quality and quantity of natural products is a human privilege; but in the arrangement and construction of the elements which make a berry, a grain, or a fruit, nature admits of no interference. Under favoring aids, she does her own work in her own way, and who will say that it is not well and wisely done? Yet, by our great refinement and re-combination of natural products, we, in effect, say that they are not properly arranged and combined for the nourishment of our bodies. We would, if we could, *grow* them ready-made for our dainty style of living, and deem it a great and wise improvement. To the taste it might seem so, but to the stomach and body it would prove as wormwood and gall. Taste, pampered and vitiated by art, is no criterion of wholesomeness. Limited to foods partaken in the natural form, its guidance may be safely followed, but with those made specially tempting by art, their digestibility is usually in the inverse ratio to their palatability. Take, for example, jellies, candies, and the richest sweet cakes; no one with long experience will deny their deliciousness, any more than he will deny their unwholesomeness. Just the reverse is true of the delicious products of nature; as, for example, the peach, the pear, the strawberry, and the tomato. Their palatability is equaled only by their digestible wholesomeness.

WHAT SHOULD BE THE OBJECT IN PREPARING FOOD.

The true sphere of art in preparing food for the table, is to *commence* the process of digestion. With some kinds this is effected by the crushing of their substance; with others, by the application of heat, which renders them tender, curdles the albumen,—as in cooking an egg,—converts starch into dextrine, and otherwise fits alimentary substances for the instant and easy action of the gastric juice. When cooking is diverted from this end, and directed alone to ministering to a perverted appetite, the stomach becomes at once the tool and the victim of the arts to please the gustatory sense. The concentration and combination of aliments having the most opposite nature and periods of digestion, impose upon the stomach a task not in the ability of nature to accomplish. Derangements, quick and severe, ensue to those much given to this kind of cookery. Medicine, or a forced abstinence, usually sets them free for a time from the infliction, though such a release is commonly viewed as a fresh license for further indulgence. It is only when the derangements become very severe and protracted that alarm is taken, and proper attention given to the causes and their avoidance.

WHY SOME HAVE ALWAYS HAD WEAK STOMACHS.

Those habitually indulging in improperly prepared aliments from childhood upward, usually impair the

digestive functions at an early age. If it occurs before the period of manhood or womanhood, the impairment becomes an inheritance to children. By those with such an inheritance, the mistakes and imprudences of such a mode of living are seen and felt in all their intensity and bitterness. So weak and susceptible to injury are the stomachs of some families, that half their thinking and talking is of medicines to relieve, or of the diet that will agree with, their digestive organs. Nearly all the members of families so constituted sooner or later suffer more or less from the miseries of indigestion, even though much more careful in their diet than thousands who, in youth, never took the slightest thought of the matter. Such a condition of the stomach is not the work of chance. It invariably arises from a prolonged overtaxing of the digestive energies. A careless or prodigal use of the stomach, even by those richly endowed, slowly but surely wears it out. This wearing out, or the unstinted gratification of the appetite on everything that it may desire, though an unalloyed pleasure to those of a free and easy disposition, will certainly in the future bring as much unalloyed misery. The spending of the inherited strength of the stomach, like the spending of a rich patrimony, no doubt abounds in delights; but to the spender and his children, how great the pain and wretchedness of impoverishment!

WHAT IS GOOD AND WHAT IS BAD COOKERY.

The unwholesomeness of food from faulty cookery has been largely dwelt upon by nearly every writer upon health. Yet the evil is but little abated. Natural carelessness, and a disposition to do as others do, or as others have done, appear to be the main causes of its continuance. Still, it seems as if its importance has been exaggerated, and for this reason. The majority of writers upon the subject, as well as nineteen-twentieths of those who have not thought at all upon the matter, take good cookery to mean only that which renders food the most pleasing to the taste. A great deal of the trite raving about bad cookery simply means that kind which fails to please a fastidious appetite, or to make men and women eat when they have as little inclination as they have need of food. By most persons, if a dish is savory it is held to be well cooked, if unsavory, ill cooked. The unsavory dish is railed at as repugnant to the taste, and therefore hurtful to the stomach. That the unsavory dish is sometimes so cannot be denied, as in the steak slowly stewed in lard, or in bread which is heavy and sour. But how does the case stand, as to savoriness and wholesomeness, with plain Graham bread, compared with warm rusk composed of the finest flour, with sugar and butter? No one who knows anything about difficult digestion will say that the first is not by far the most wholesome, while no epicure will say that the second is not by far the most palatable.

Good cookery, as I have before remarked, consists in that process which facilitates or commences digestion; and bad, in that which hinders or retards it. Extreme refinement, concentration, and the complex mixing of food, tried by this test, must, one and all, be pronounced unwholesome, and therefore bad cookery. And so in fact they are, as a ripe experience always serves to make plain. Those nations that have these refinements in the most eminent degree, or that have what are popularly known as the best cooks, have the worst stomachs. The cookery of the negroes of the Southern States, and that of the Indians on the plains, are the reverse of savory to refined palates, while their digestive organs are among the best in the world,—dyspepsia being almost unknown among them.

Of the many books published on the subject of cooking, there are few, if any, that have not receipts by the score which cannot be excelled for producing indigestion. The motive which animated their writers seems to have been to show how to prepare dishes for the table of the richest and most tempting kind. The family who would attempt to follow out their directions, even for a limited period, would soon all become dyspeptic,—with bad breaths, decaying teeth, distressing headaches, and sallow complexions.

UNRIPE FOOD UNDER SOME CIRCUMSTANCES UNWHOLESOME, UNDER OTHERS WHOLESOME.

Unripe food, whether animal or vegetable, is neither so digestible nor so nourishing as that which is mature. What the body needs from food is ripe, fully-organized matter, with all its accumulated energy. The sort of aliments most abounding in these qualities is that which has had time to ripen and gather solar energy. Hence unripe aliments are always weak and watery, apt to disagree with the stomach, creating diarrhœa and flatulence, and impart but little strength to the body. When the nervous energies are exhausted by severe labor, and a full meal is made of such food, an attack of cholera morbus is a common result. Conjoined with the bad air often found in cities and in badly-constructed houses, with the exhausting effects of great heat, unripe food becomes a fruitful source of disease and of death, especially with the young. Under some circumstances the use of immature fruits is, however, beneficial. In the change from the cold to the warm season of the year, when the blood is rich, black, and thick from an abundance of fatty matter, it is the most readily thinned, reduced, and cooled by the prudent use of such aliments. The relaxed condition of the bowels which they produce, is rather beneficial than otherwise; while the blood, failing to receive the usual quantity of nutriment from the accustomed bulk, undergoes the kind of change which prepares it for the extreme heat

of midsummer. This change is wrought by nature, during the spring season of the year, for the inferior animals. Their food is then weak, washy, and relaxing; and as all know, though they are without high endowments, they are almost free from disease.

THREE DISEASES ARISING FROM DISEASED FOOD.

The use of diseased food is always hurtful. It does not contain the perfection of organization and strength requisite for the sustenance of the body, but only matters which infect and tend to destroy the life of any part with which they are brought into contact. Fortunately, food is not very often in a diseased state; so there is not very much to guard against in this respect. There are, however, three diseases which have this mode of origin, and which have been brought into prominent notice by their occasional severity and fatality. These are: erysipelas, which has prevailed extensively in Germany from the use of rye bread containing large quantities of the blasted grain; the milk-sickness, from unacclimated cattle; and the trichinæ, from uncooked pork. It is not often that rye, milk, and pork are so diseased; but when any one of them is so, and is largely used as food, and without any precautions, the disease to which it gives rise is very severe, and usually fatal.

No extended remarks are necessary in reference to the eating of a diseased or partially-tainted food. No one with the least refinement would think of

eating this kind of food; and those who, from a greedy parsimony, carry out so disgusting a practice, may as well be let alone, as they are joined to their idol,—avarice. It is true, there are some of a more pretentious class, whose *cuisine* embraces meats partially decomposed; but commonly they are those whose taste has become decidedly morbid,—gastric debauchees, so far gone that they have to resort to disgusting devices, like that of exciting disease in the liver of the goose, in order to procure a table dainty, to arouse a little pleasure in their worn-out nerves.

HASTY EATING.

A hasty manner of eating is another source of trial to the digestive organs. The rapidity with which food is partaken in the United States is perhaps greater than in any other civilized country of the world. The restless, energetic Americans cannot, without great effort, spend an hour or two at a time at the table, like their more easy-going cousins across the water. The pace of the hands at the table is not a walk, but a gallop,—knives and forks sharply rattling and rapidly twinkling between plate and mouth. The aid of liquids in large quantities is employed to hasten the swallowing process. Each mouthful of food is thus, after very imperfect mastication, washed rapidly into the stomach by tea, coffee, or water, to make room for the next one already at the threshold. The food is thus swallowed in a very rough and lumpy condition;

and the stomach has the work of the grinder teeth to do besides its own. Of course, none save the strongest stomachs can long perform such double duty. Cramps, aches, indigestion, and headache are some of the common results.

THE ONLY NATURAL DRINK.

If it is a mooted point what a man should drink, the question is usually determined by pleasure, custom, or fashion. The desire for drinks—not from nature's need, but for pleasure—is of two kinds: that for what is simply pleasant to the palate, and that for excitement or stimulation. One or both commonly determine what drink, how much, and how frequently it is to be taken.

Water is the natural drink of man, as it is of all organized beings. It enters more largely into his composition than any other substance, giving liquidity to the blood, moisture to all the tissues, and serving as the only solvent to all soluble matters in the body. Thirst is the indication when drink is needed for one or all of these purposes, and any other besides water fills this want of the body in precise proportion to the quantity of water which it contains. The simplicity of the means and the end, however, does not suit man's intense craving for pleasure and excitement. The artifices to augment these may be numbered by the score. Thousands seldom take a drink without some substance in it to excite pleasure, and even take drink after drink when there is no thirst, or simply on account of the pleasure afforded. It is

owing to the fact that such foreign substances in drink as tea, coffee, and spirits, act in an agreeable manner upon the sensibilities of the body, that they are so generally used, and, I may add, so ably defended. After the habit of drinking them is contracted, and the will a slave to their use, it is rare candor not to ransack the records of knowledge for some apology, excuse, or reason why their use should not be discontinued.

THE USE OF STIMULANTS LIKE TEA, COFFEE, AND WINE.

Tea, coffee, and spirituous drinks have been classed as tonics, stimulants, and accessory foods, or foods which aid others in nurturing the body. For the healthy, or those who wish to preserve such a state, no stimulants or tonics are needed: it is only after sickness invades the body that a medicine like a stimulant is of any service. But why should they be called accessory foods? Do they fill a vacuum in the great abundance of aliments? or do they render the strengthening qualities of those aliments more perfect? Is the growth, the development, or the health of the mind and body more perfect among those who use them than among those who do not? Dr. Chambers, evidently impressed with an affirmative view upon these points, says that "the opportunity for temperately enjoying them has always coincided with the advancement of a nation in the scale of humanity:"* thereby intimating that what

* Digestion and its Derangements, p. 188.

he calls accessory foods have been contributors to such a result. Are all the practices and habits which usually coincide with advancing civilization to be put in this category? May not the vices of civilization, of which the temperate or intemperate use of liquors is an acknowledged one, be communicated to savages without raising them in the scale of humanity? On this continent, the introduction of spirituous drinks among the Indians has done more to *lower* them in the scale than any other single cause. No; the use of intoxicating drinks, temperately or otherwise, is in no sense a cause of the advancement of a people in the scale of humanity, but a retarder,—one of civilization's evil accompaniments,—just as insanity is. The use of refined and concentrated foods is as much a concomitant of advancement in the scale of humanity as that of stimulating drinks; and every candid, closely observing physician will admit that the former have more to do with producing the manifold disorders of the stomach than all other causes combined. Are we to speak gently and defensively of such foods because they give pleasure, because we are addicted to them, or because they are among the accompaniments of the advancement of a nation in the scale of humanity? Such a plea is well enough fitted for moral and political optimists,—for those who are satisfied with things as they are, or who have no faith in the ability of human nature to attain a higher and a purer moral, physical, and intellectual development.

MILD STIMULATION.

The part of the body most strongly affected by stimulants is the nervous system. The functions of this part, such as the thoughts, feelings, and will, are always more or less changed by their use. The demeanor displays an unnatural, though agreeable, liveliness, which is afterwards succeeded by an unnatural and disagreeable gloominess. As it is upon the nervous structure that stimulants mainly act, so it is upon this part that the diseases which they produce are mainly seen. The life-long play of even gentle exhilaration upon the nerves first weakens, and then perverts their action. Such an effect may not be witnessed in those of strong constitution in the first or second generation, but come it certainly will, and usually in a very sad and distressing way. To no other cause can the great prevalence of nervous derangements in our day be fairly ascribed.

The connection between this nervous impairment and its cause is very commonly overlooked, from the fact that its manifestations do not usually follow immediately after the application of the cause. Yet, as before remarked, this is the usual way in which hurtful habits or agents act in destroying health. A year or two's continuance, for example, of costiveness is commonly required to produce piles; but if a caution be given only a month or two before the disease is manifest, the reply is, "Costiveness does not hurt me in that way." Warn a person of the probability of corns forming on the toes by the

wearing of tight shoes, and, if these excrescences have not yet shown themselves, the answer is, "Tight shoes do not hurt me in that way." Before the disease occurs, men and women seem to be willingly blind to the fact that it is not a few, but many days of pressure which develop corns; that it is not one excess in drinking, but many, which develop tremens; that it is not one day's abuse of the stomach, but many, which develops dyspepsia. Words of caution to young men concerning the injurious effects of tobacco, elicit, in ninety-nine out of a hundred cases, the reply, "It does not hurt me." Does not hurt you! Wait and see. In years to come, when you ought to be in your prime, you will be a poor, nervous, irritable, nerve-dried creature. Your hands will tremble, your head will ache, your sleep be fitful and disturbed, your digestion impaired; in short, the unnatural and transient pleasure at one end of your life will be more than counterbalanced by the discomfort and misery at the other. It is a truth of the greatest moment, which ought to be so impressed upon the mind as to be always rising up within it, *that transgressions of the laws of health, not punished at one end of life, are sure to be at the other.*

A TEST OF DRINKS THAT ARE NATURAL AND WHOLESOME, AND OF THOSE THAT ARE NOT.

The provisions of nature for satisfying thirst are ample, and exactly suited to the necessities of the system. Pure water never causes disease, the crav-

ing for it never becomes unnatural, it does not benumb the nerves, destroy the appetite, burn up the moral perceptions, and cause reason to reel and sprawl in idiotic semblance. All the stronger stimulants, when used for some time, make men slaves to their use. Their influence, and the craving for them, *grow* day by day, leading unto greater and greater excesses, until disease and untimely death—the lash and the guillotine of natural law—thrust their stings into the vitals. All are aware that such are the common results from the use of strong stimulants. The nervous wrecks of humanity to be seen upon every hand, upon whom natural law is being vindicated, and the graves of thousands upon whom it *has* been vindicated, bear sad and emphatic testimony upon this point.

That the use of water never leads to an increasing and unnatural craving for it, and that it does not tend to the production of disease, while stimulating drinks invariably do both, is conclusive evidence that the use of the latter is wrong and unwholesome in effect. The evidence showing that stimulants pervert the moral character, derange the intellect, and bring on long trains of misery and disease, is overwhelming. If it be asked how the epileptic condition, the raving maniacal mind, the idiotic child, the paralytic brain, the infant writhing in convulsions, the head almost crazed with pain, the nerves racked with misery, the young, wasted, paralytic arms, the crooked eyes, the clubbed feet, the terribly depraved nature, arose, the answer must be, that, immediately or remotely,

they came from some unnatural or artificial play upon the excitability of the nervous system.

THE ULTIMATE DESIGN OF A GROWING APPETITE FOR STRONG DRINK.

It is a familiar fact that, by the constitution of man's nature, the inclination to do evil grows with its practice. By yielding to the inclination, temptation acquires more and more force, until finally it becomes the master of our will. It is in this way that evil-inclined persons are drawn on to their own destruction. If temptation did not increase with evil practices, and these bring disease and death in their train, there would neither be the evidence of wrong-doing, nor of the weeding out of the most ignorant and depraved of our race. Although, from a partial standpoint, this process of weeding out the worst and preserving the best may often seem slow, yet viewed by an eye which covers several generations, the tardiness disappears, and nature's retributions and rewards are seen to be sufficiently certain, speedy, and just. The tendency everywhere, and at all times, in a family notoriously wicked and dissolute, is to its ultimate extinction. Though this is not instant or speedy, it is none the less sure. An intemperate father dies with delirium tremens, a son follows in his footsteps, another leads a somewhat more reputable life, but his children, or his children's children, if not improved in some way, die in infancy, either suddenly, or from wasting disease, or they commit suicide, or die in a

mad-house. The meaning, therefore, of the well-known inclination of the drunkard or the opium-eater to go on to greater and greater excesses, is to lead him to his own destruction.

Professor Laycock, of Edinburgh, evidently had no great confidence in this extirpating process of nature, or in the survival of the fittest, when he penned the following: "Of the three hundred thousand educated in the workhouse, eighty per cent. are failures when sent into the world. A large proportion pursue evil courses, join the predatory classes, or fall stupidly into crime, or else they either return to the workhouse, or become inmates of the county asylum. I might, if time allowed, point out how drunken, vicious imbeciles, tainting their offspring to the third and fourth generation, serve to fill our asylums to overflowing; and that unless means be taken to restrict their personal liberty during the fertile period of life, there must of necessity be a continual increase in the insane, imbecile, vicious, and degraded part of our population."*

Greater care in tracing the history of any family of *persistingly degraded* conduct throughout several generations, will show that the tendency is always to extinction; or that the laws of nature operate in wiping their blood from off the earth. It is as true as it is just, that this process of extinction is often delayed, or it may be altogether stayed, by the crossing of a bad with a better blood. But when neither

* London Lancet, 1868, p. 712.

this nor reformation occurs, the above-mentioned result sooner or later ensues.

EFFECTS OF TEA, COFFEE, AND TOBACCO.

Tea, coffee, and tobacco do not stimulate with sufficient power to produce the sad effects of opium and fermented liquors. The greatest objection to their use is contained in the fact that they prepare the way by developing the desire for the strongest kind of stimulation. In more exact terms, their habitual use begets that state of the nervous organization which causes the desire for excitement or nervous stimulation to become a controlling impulse. One who is a slave to the use of tobacco, coffee, and tea has therefore the precise state of the nervous system which tends to lead him to the lowest depths of inebriation. And this state of the nerves, like any other, is a transmissible quality. The inclinations, appetites, and mental grasp which a child displays are never accidental, never spontaneous,—they are all strictly and wholly derived. The state of the nervous system in parents, as well as of their lungs, liver, and stomach, differ at one time from another; and it is to this difference that the differing qualities arise in offspring of the same parentage. The more closely a father and mother reflect upon all the circumstances, states, and conditions of body and of mind which immediately preceded the procreation of this son, or that daughter, the more clearly do they perceive the relation and dependence of the peculiarities of the

child to those which existed in themselves. Suppose, then, that a child is born to parents in *both* of whom the desire for tobacco, tea, and coffee is very strong, and at a time when their nerves were more affected by stimulation and depression than usual: that child will inherit that desire for stimulation and that state of the nerves. As soon as it knows, and is able to gratify this craving for excitement or stimulation, it will indulge even more largely than the parents,—unless good training and influences prevent. Even should these influences hinder for a time any display of the unnatural appetite, it will very likely be seen whenever they are removed. Many such are so unfortunately constituted that they would rather have artificial excitement and die, than only natural and live.

With these trainers or educators constantly and almost universally at work, is it any wonder that the temperament in which the desire for strong drink is an irresistible longing, should be upon the increase; and that though the old drunkards and their dissolute progeny are cut off, there is always an abundance of fresh recruits for a like destiny? The advocates of temperance too often seem to think that by putting out of the way the thing craved, and leaving the craving to take care of itself, nearly all is done that can be to suppress the evils they are contending against. It is a fundamental mistake. So long as an unnatural craving for powerful stimulants is nurtured in so many by the use of the weaker kinds of stimulants, so long will thousands every year miserably

succumb to their intense desire for and use of the stronger.

That the milder stimulants, if habitually used, act in this way upon the nerves, or as agents in exciting a taste for the stronger, may be shown by their effects upon the body. Tea, coffee, and tobacco, it has been experimentally determined, act upon the body in precisely the same manner as alcoholic drinks,—the sole difference being one of degree, not of kind. They are all retarders of the waste of the body, or, in other words, of the changes in the atoms of which the body is composed. These changes or wastes are necessary, too, for the well-being of the body. Indeed, without them life would immediately cease. This is not the only similarity in their action to alcohol. The desire for the milder stimulants, such as tea, coffee, and tobacco, *grows* with their use, precisely as does that for alcoholic drinks, opium, absinthe, and hasheesh. This is a peculiarity *never seen* in the use of any natural food or drink, such as water, apples, or oranges. The tendency is rather the other way, a more or less constant use not unfrequently decreasing the relish.

The excessive and habitual use of tea, coffee, and tobacco works other evils besides the more remote ones just pointed out. They often cause, though in a minor degree, trembling hands; they disturb the sleep, impair digestion, create nervous blindness and headache, and excite distressing sensations in the heart. The point of the tongue on which the end of the tobacco-pipe rests sometimes becomes can-

cerous; and the fumes of this powerful narcotic waste, wither, and weaken the delicate texture of the nervous organization. No healthy person can claim any good from the use of tobacco; while an exposition of the harm it has wrought would fill many pages.

ALCOHOL IN HEALTH.

The immediate effects of alcoholic stimulants are always deleterious during health. Apologists for their use have diligently sought, and, to many, have seemingly found, some evidence of benefit; the most popular being, that they retard the natural waste of the body in the performance of its functions. But it may well be asked, what good can possibly arise from retarding a perfectly natural process in health, or under ordinary circumstances? Physiologists are agreed that the farthest they can penetrate into the nature of life is in these same incessant atomic changes in the matters of which the body is composed, involving a constant tearing down and building up of its structure. The sudden arrest of these changes constitutes death; and then the matter of the body is given over to another kind of change, its decomposition according to chemical law. The same kind of unceasing change in living particles of matter is the ultimate process open to our insight in vegetable life. Cause by artificial means its partial arrest, as by extreme cold, and injury will follow; cause its complete arrest, and death is the result. The horticulturist who should seek to retard the

natural changes and waste in plants, or the stock-breeder who should attempt the same thing with his cattle and horses, or give them whisky or tobacco, either as a matter of economy to effect a saving in their waste of flesh, or to preserve their health, might well be considered as of unsound mind. Yet what man is too rational to do to things below him, he is irrational enough to do to himself. Were it not for the profit arising from the sale of spirituous drinks, and the pleasure derived from drinking them, no one would apologize for their use, or seek out arguments to sustain the idea that they are ever useful to healthy men and women.

The experiments which have shown that alcohol retards the waste of the body, have also shown that immediately after its influence passes off, waste is just as much accelerated as it was previously retarded: so that no permanent gain can really be claimed for it.

The second benefit claimed for the use of alcoholic drinks is, that they assist in sustaining the heat of the body. According to the received theory of the generation of animal heat, and the means through which it is maintained in the body, it has been supposed that at least a part of the carbon in alcohol is given up as fuel for that purpose. Later investigations have demonstrated the erroneousness of this opinion. Alcohol is expelled from the body as alcohol, its carbon unused, and incapable of being used. The glow of warmth which follows after drinking it, is not the glow of actual heat, but the benumb-

ing sting of the poison upon thousands of nerves. The thermometer shows that the heat of the body under its influence is not increased, but actually reduced. The experience of Drs. Kane and Hayes, and indeed of all explorers in the Arctic regions, confirms this view. They found that those who used spirits were much less able to endure the extreme cold than those who did not.

According to some of the most prevalent notions as to the good effects of whisky, it might be supposed that if ever useful it ought to be with the soldier in the field. He is exposed to all the rigors of the day and the night; he is often subjected to great and sudden changes of climate; he has to drink water now of one quality, now of another, and his entire round of duties always border upon the extreme. The SANITARY MEMOIRS of the rebellion furnish decisive testimony on this point. Professor Flint says, "The great majority"—that is, eighteen out of twenty surgeons cited—"are of opinion that the issuing of a whisky ration is injurious instead of being useful; but some hold to the belief that spirits may be given to advantage on occasions when the physical powers are unusually taxed, and that some feeble persons may do better than without them." (Page 113.) On this subject no testimony can be stronger than that given by Inspector-General Sir John Hall: "My own opinion is that neither spirit, wine, nor malt liquor is necessary for health. The healthiest troops I ever served with had not a single drop of any of them; and although they were exposed to all the

hardships of Kaffir warfare, at the Cape of Good Hope, in wet and inclement weather, without tents or shelter of any kind, the sick-list seldom exceeded one per cent."*

ALCOHOL AS A CAUSE OF DISEASE.

Having examined some of the alleged benefits of alcoholic drinks in a state of health, the next point for consideration is the injurious effects arising from their habitual use. These are plainly and terribly apparent in the degenerations of structure and the nervous disorders to which the habitual drinker is liable. The one who has long been even a moderate drinker, seldom, if ever, escapes degeneration of some structure of the body. The most common is the conversion into unresisting fatty matter of some of the strong fibres in the walls of the heart, or in the coats of the blood-vessels. This transformation may be only partial, and visible only through the microscope. When it is nearly complete, there is such a weakening of the part that it either fails to perform its functions, or is torn by some unusual strain, producing, when at the heart, instant death. This sort of fatty degeneration is also frequent in the brain, seriously affecting its structure, and leading to rupture there, which results either in paralysis or death by apoplexy.

* Medical History of the Crimean War, vol. i. p. 504.

DELIRIUM TREMENS.

Delirium tremens is a disease of the nervous system, produced only by the use of alcoholic liquor. Its greater frequency now than half a century ago has led many to suppose that the adulteration of liquors in common use is its chief cause. Not a few temperance lecturers draw fearful pictures of the dreadful poisons the drunkard takes into his stomach, and attribute the ravings of tremens to this cause. The fact is lost sight of, that no poison save alcohol is capable of producing delirium tremens.

That the disease is more common at the present time than many years ago, is attributable to two facts. More persons drink spirits now than then, and those who drink at the present day, as a rule, have less resisting power against their evil influence. Among farmers, whose out-door life, active habits, and temperate behavior in everything save in spirit-drinking are conducive to health, delirium tremens is as rare as it ever was. The disease is almost confined to towns and cities, or to those who are enfeebled by an indolent in-door life, or by impure air and licentious habits. The farmer works his liquor off in his active out-door occupation; the denizen of the city keeps it in him by his indolent habits, and enhances its evil power by other causes, which enfeeble the life of the body.

Men of iron constitution and active habits can withstand the effects of the best or the worst whisky (for there is really little difference, both being poisons) for many years, or even for a lifetime, without having

an attack of this disease. But the child born to such a one, after the habit is contracted, never can. The excellent constitution which the father inherited, and wasted in his lifetime, requires several generations when the loss is transmitted, contrariwise, slowly and painfully to regain. Precisely as the one who wastes a rich patrimony in reckless dissipation transmits his poverty to his children, and so becomes the first of a series of generations that have to struggle on in poverty and obscurity, he who wastes the strength of his iron nerves upon this poison transmits this waste to his unborn child, and so becomes the first of a series of generations that have to make a life-long struggle against the slightest indiscretion, or else suffer from some nervous torment. Life to those so unhappily constituted is often more like a curse than a blessing. They have that unbalanced, unharmoniously acting nervous organization which predisposes so readily to disease, to deeds of recklessness, of violence, and of death.

INSANITY AND IMBECILITY.

The habitual use of spirituous drinks is one of the most fruitful causes of insanity and imbecility. The records of every insane-asylum abound in testimonials to this fact. Dr. Copland considers the use of intoxicating substances as the most influential of all the exciting causes of insanity among the lower classes.*

* Dictionary of Practical Medicine, vol. ii. p. 568.

It is a well-established fact that insanity is a hereditary disease. The origin of this family tendency is not spontaneous, but the product of an impairment of the nervous organization, brought about by unnatural habits or transgressions of organic law by one or more in the ancestral line. Dr. Ray, a learned observer and writer upon this subject, says that, "as a general rule, more than one generation is required to accomplish the various stages in the development of the disease, and that the essential thing is nervous impairment."* Now, what cause of nervous impairment is more common and profound than that arising from the use of alcoholic drinks? Men with the most brilliant intellects frequently become, under their influence, stupid, silly imbeciles. To say that any one after he arrives at such an unnatural dotage (he is usually and most fortunately incapable) can procreate children as perfect in nervous organization as before his nervous impairment, is simply to contradict one of the plainest and best-established laws of physiology. It is true that the impairment transmitted to the child by the father is often greatly mitigated by an excellent nervous organization in the mother, though even then the progeny is not what it would have been had both parents alike abstained from the vices which destroy the perfections of the body. But suppose that the mother has not the required strength and perfection in her nervous organization to make up for what the father lacks,—a thing quite as apt to

* Trans. Amer. Med. Assoc., vol. xviii. p. 402.

happen as the contrary,—the effect upon the children must be a marked degeneracy. Keep up this impairment for a generation or two, weaken or unbalance the subtle coils of the brain-force, and sooner or later will there be displayed the disordered whirl of the thoughts characteristic of the maniac.

It is not claimed that the use of intoxicating drinks is the only developing cause of insanity. Far from it. It is only one, though one of the most common and influential. That these nervous exhilarators are powerful impairers of the nervous system there is not the slightest ground for doubting; and that this impairment, as stated by Dr. Ray, is the essential thing in developing the insane tendency, is further shown by the fact that families with the insane taint, more commonly than others, suffer from related nervous diseases, such as convulsions, epilepsy, and paralytic distortions.

CAUSE OF HOB-NAIL LIVER.

Medical writers are unanimous upon the point that the free use of ardent spirits also tends to produce disease of the stomach, liver, and kidneys. The fatal affection known as hob-nail liver more commonly arises from this habit than from any other. The habitual drinker, with a very strong nervous organization, may be a victim to a fatal disease of the stomach, liver, or kidneys, earlier than he does to disease of the nervous system; so that, if he does not die from paralysis, delirium tremens, or softening of the nervous structure, he will unquestionably

die from disease in one of the first-mentioned organs. The stomach of the habitual drinker is always unnaturally thick and full of blood. Such a peculiarity seems to be nature's mode of defending herself against her liquid foe. Expose any part of the skin to a steady pressure, and soon vital energy will erect a thick, horny wall to protect the tender parts within. Just so it is with the stomach of the drunkard, which, on this account, becomes less and less susceptible to the influence of stimulants. But the imbiber is prompt to overcome nature's resistance. Larger, stronger, and more frequent become the potations, continually and successfully seeking to overcome her barriers.

BRANDY FOR TRAVELERS.

There is a notion widely entertained, that spirituous liquors afford protection against many diseases, especially those of the stomach and bowels. It is, for example, thought that a traveler during a cholera year must use some brandy in the water he drinks, even if he never did before. If he returns to his home without an attack, the brandy protected him, and the escape while under its influence is often mentioned, but the attacks which occur in others while using it are never referred to. This is very much like the simple-hearted woman's dream; which, when it comes out true, is always remembered and often referred to, but the hundreds that come out false are never thought of or mentioned. Individual experience in determining whether brandy affords any pro-

tection against disease or whether it does not, is utterly worthless. Two travelers, for instance, are alike exposed to disease; one uses brandy, the other does not, and yet both escape. What does this prove? Or the one who uses brandy escapes, while the one who does not is attacked by disease. What does this prove? Why, by popular logic, because he used brandy he escaped. But reverse the case. The one who uses brandy is attacked, while the one who does not escapes. What does this prove? Why, by the same mode of reasoning, just the reverse, or because the brandy was used the attack occurred. Now, just such opposite examples are continually occurring; and the man biased in favor of brandy instances the one, and the man biased against brandy instances the other. Clearly, such experience is of no value in arriving at the truth. Yet it is the precise sort of evidence accepted by the great bulk of even thinking men upon this point. Only by comparing results among a large number of persons, can the degree of protection from, or of liability to, disease, under the influence of any special agent or circumstance, be determined. The testimony of army surgeons, whose facilities for observation were excellent, has already been given; and, as will be remembered, it is almost unanimous against the use of stimulating drinks for the preservation of health and strength, even under extraordinary conditions. Indeed, I have been able to meet with no really eminent medical authority who is not of this opinion. Says Dr. Pereira, "The dietetical employ-

ment of wine is either useless or pernicious." Says Dr. Carpenter, "Alcoholic liquors are, first, universally admitted to possess a poisonous character; second, when habitually used, they tend to produce a morbid condition of the body at large; third, the frequent occurrence of chronic diseases in those who have long used them, affords grounds to believe that they act by perverting the nutrition of the body; fourth, the especial liability of the intemperate to zymotic disease" (of which cholera is one) "shows that they tend to hinder the natural changes in the blood; fifth, extended experience has shown that they diminish rather than increase the capacity to endure fatigue, mental or bodily labor, and extremes of heat and cold."*

THE WHOLESOME DRINKS RECOMMENDED BY QUACKS.

The attempt to prove that the best way to protect the body from disease is to use an agent which, as every competent observer acknowledges, acts by subverting the health, strength, and energy, is certainly, to say the least, somewhat bold. The plainest common sense would seem to dictate to do that which would have just an opposite effect; namely, to increase health, strength, and endurance. The statements so often seen in newspapers and almanacs, that alcoholic liquors, either in the form of bitters or wine, tend to preserve the health and to protect the system

* Human Physiology, p. 78.

against disease, may be placed one and all to the credit of some interested, cunning, and unprincipled quack. Testimony almost without limit, by the most eminent physicians in all parts of the world, might be presented to show that such beverages invariably predispose to disease in many forms, and especially to Asiatic cholera; and that, of all men the most likely to die when once attacked, inebriates are the surest.

THE EFFECTS OF SPIRIT-DRINKING UPON THE FUTURE OF OUR RACE.

Though the immediate effects of spirit-drinking are disastrous, they are insignificant compared with those which the habit is working out for posterity. The degeneracy of the nervous energies, the liability to and frequency of nervous disorders,—all of them painful, distressing, and terrible in their nature,—are, with few exceptions, the consequences of the use of artificial stimulants. The unnatural excitement which these agents produce in the nervous sensibilities is working for our children, and our children's children, a legacy of evil more terrible than any in which we can be otherwise instrumental. The meaning of the contradictory proverb, "weaker and wiser;" the meaning of the ever-increasing proportion of the human family who become diseased in the most painful ways, stricken in mind, in feeling, or in motion; the meaning of the increase in almost every form of moral perversity and of crime; the meaning of the

need of vast and ever-growing asylums, crowded with human beings, deaf, dumb, blind, idiotic, and insane, is simply to be found in the ever-increasing search for pleasure through deleterious nervous agents. If the impairing drafts upon the nervous structure are not stayed,—if many of the vices of modern civilization are not corrected,—ere long the nervous disorders and diseases by which we are afflicted will become so common and so severe, that the care and support of the helpless will be a great and melancholy burden to the State. Instead of the need of three or four asylums in each State of the Union, they will have to be built by the score; and the enlarging number of the idiotic, the insane, the contorted, the diseased, and slowly dying of our population, will form a very sad and pitiable spectacle. Not only so, but the ratio of sickness, all over the land, will steadily increase, the proportion of physicians will steadily augment, the consumption of opiates and chloroform for nervous tortures will become greater and greater, the endearments of life will be more frequently rent by untimely bereavements and terrible afflictions, and the number of those to whom life will be a burden, and who will deliberately do violence to their own lives, will increase from day to day.

MODE OF OBSERVING THE SECOND LAW.

Over-adequateness in the use of food being the chief mode in which this law is infringed, to the best manner of correcting this will the attention first be directed.

To guard against over-eating, a leading requirement is to have the viands for each meal few in number, unconcentrated, and but little, if any, refined in quality. Whenever they are otherwise, when there are two or three courses at a meal, each succeeding one more and more savory, excess in eating and an over-difficult-to-digest complexity are sure to result.

In the preparation of food for the table, one of two objects is practically acted upon: either to render it as delicious and tempting as possible, or to make it ready for easy and quick digestion. Those who seek after the latter object more than the former, are usually invalids,—undergoing a course of dieting,—who aim to have the stomach digest as much as it can with the smallest possible expenditure of power. The proper rule to be observed for those who desire to preserve the health and strength of their digestive organs, is, of course, to avoid the cause that destroys both these conditions,—that is, not to overwork the stomach.

As we have seen, while treating upon the violations

of this law, there is little likelihood of overworking the stomach by the quantity of food partaken, if the quality is only what it should be. The starting-point of all the mischief lies in concentrating and over-refining natural aliments, and then combining quite a number of them, to make very tempting delicacies for the palate.

To those disposed to philosophize a little, the thought will readily occur, that the Hand that placed man on the earth must also have provided for him food which, in form and composition, is exactly suited for the support of his health, strength, and vigor. The purposes of that Hand, it must be remembered, are never bungling and harmful. What in our ignorance is often deemed a useless provision, afterwards turns out in our knowledge to be the most abounding in wisdom and utility. This, as already remarked, is well illustrated in our attempt to improve upon nature by an over-refinement of wheat-flour. The coarser part of the flour, which is excluded from our tables, contains, as science has shown, the precise elements needed for the nourishment of the solid and resisting parts of the body. This outer part is thrown away simply because it is not quite so palatable, soft, and fine as that made from the inner part of the grain. The experience of physicians also confirms nature's wisdom and man's ignorance in this matter; for the stomach and blood are often known to be surfeited with elements for the nourishment of one class of tissues, while another class are suffering from a lack of their appropriate food. The crushing

of the grain is proper, it saves labor for the jaws and teeth; the cooking is also proper, it commences the process of digestion; but to separate the components into a more refined, delicate-looking, and delicate-tasting, and into a coarser and more insipid,—the one to be retained and the other rejected simply upon the plea of deliciousness,—is as much as to say that the most perfect form of food provided for man is, after all, very imperfect.

THE TRUE STANDARD OF FLOUR REFINEMENT.

By excluding all the coarser particles of flour in the making of bread, the labor of the stomach to digest it is very much increased. The very fine powder to which its granules are reduced gives its mass a closeness, an almost impervious agglutination, which hinders the gastric juice from a prompt action upon all its particles. Every experienced druggist is aware that when he wishes to extract the virtues of any medicinal substance, such as roots, by alcohol,—which, by the way, is one of the most penetrating of liquids,—if the roots are ground very fine, the process is neither so quickly nor so thoroughly accomplished as when in a coarser state. For the easiest and quickest digestion, the proper standard of fineness is what the molar or grinder teeth can do: all beyond this is worse than useless, rendering the digestion of food more difficult.

PREVENTING COSTIVENESS.

Not only is the work for the stomach thus made easier, but the coarse, branny particles left after digestion is completed, furnish the appropriate stimulus to a regular action of the bowels. The habitual use of bread with branny particles in it is the surest and best of all cures for habitual costiveness. In fact, I have no hesitation in saying that, by the regular use of this kind of bread, and a moderate degree of exercise, such a thing as torpid bowels would be almost unknown, excepting when produced by disease in some other part of the body. In securing a daily or regular evacuation of the bowels, it is of course necessary that the calls of nature should not be neglected. If they are, no course of dieting, no medicine, will effectually remedy the irregularity and the injury thereby inflicted. Young and old should therefore consider such calls of nature as paramount to any considerations of business, pleasure, or convenience.

THE USE OF CONCENTRATED FOODS.

Concentrated foods, by which are meant those reduced by prolonged boiling to a much smaller bulk than they had in a state of nature, should be partaken of, if at all, with a very sparing hand. To this class belong sugar, sweetmeats, candies, preserves, jellies, marmalades, and fruits, such as apples and peaches, reduced by prolonged boiling to concentrated butters. Sugar should be used for culinary pur-

poses almost as sparingly as salt. Now that the art of preserving fruits by hermetical sealing is so generally known, there is no necessity for boiling them for hours with sugar for the purpose of their preservation. It is admitted that this process is a very admirable one for making fruits keep well *out* of the stomach, but it is just as admirable for making them keep well *in* it. All such preparations are, without exception, exceedingly hurtful, and ought to be banished from the table of every sensible family. The same must be said, and with greater emphasis, of every form of food composed of a number of these articles; such as sweet cakes, rich pudding, and complex pies, like the mince. For the epicure, for those who allow their stomachs to command their heads, who care neither for the miseries of dyspepsia, for severe headaches, for horrible dreams, for sick stomachs, for bad breaths, for aching or decaying teeth, for lost appetites, for frequent and distressing attacks of biliousness, for miserable, gloomy, suicidal hypochondria, nor for the permanent breaking down of the digestive power of the stomach, ten, twenty, or even forty years before its time, with a great and sorrowful shortening of life, the habitual use of such kinds of food is warmly commended.

HOW MUCH TO EAT AT A MEAL.

With a few simple, unconcentrated, and unrefined dishes for each meal, the danger of over-eating is small indeed. The food is then in a nearly natural state,

well fitted to satisfy the cravings of hunger without inciting to great excesses, impairing the energies of the stomach, and throwing a cloud over every source of rational enjoyment. Children, as well as adults, could then with safety eat all they want, or, more correctly, to the full satisfying of hunger, for some are so unfortunately constituted as to eat wantonly, or without regard to the consciousness of satiety. Even with such, the harm would be comparatively slight; for it is the artifices in the preparation and varieties of food which lead to the worst forms of intemperate eating, and operate most quickly in producing the worst forms of dyspepsia.

GRATIFYING A DESIRE FOR VARIETY.

While a great variety of dishes for each meal ought to be studiously avoided, variety in one meal from another ought to be just as studiously sought; all the while paying heed to the *instinctive cravings of the system* at various ages, times, seasons, and conditions of life. Nature, through this means, indicates just what she needs,—the acids of vegetables and fruits, the carbonaceous or fatty foods for keeping up the heat of the body, or the nitrogenous for repairing the growth and waste of muscle. These cravings, under ordinary circumstances, and with foods but little changed from their natural state, are worth far more to human welfare, and are far more reliable as a practical guide, than all the elaborate rules and deductions of science.

If these directions were observed, over-adequateness *in certain kinds of food*, or, indeed, in any kind, would seldom occur. But there is so much artificiality, or else such an unbroken routine in the kind of food spread upon the table, that thousands partake of what is before them from the pure force of habit, and never reflect upon the true meaning of the repugnance they every now and then feel for certain kinds of food. The truth is not realized that this repugnance has as its basis the real needs of the body. The standard dishes for the table, with vast numbers of people, from the beginning to the end of the year, during the colds of winter and the heats of summer, are fried bacon and warm bread for breakfast, dinner, and supper. From the fact that their fathers ate them in this regular way, they think they must, and so these articles are on the table as invariably as the knives and forks. The distaste for such foods is often extreme during the first warm days of spring, as well as throughout the heats of summer. Yet oftentimes they are all that can be obtained, and those who do not choose to eat them may go hungering all the day. So the distaste for them is overcome, or they are almost forced upon the palate, or rendered more agreeable to the cravings by the use of some sour pickles, or green vegetables or fruits.

SUMMER AND WINTER FOOD.

The kind of food needed and adapted to the taste and states of the body is very different in summer

from what it is in winter. A very large amount of carbon is needed to sustain the heat of the body in winter, and very little in summer; and it is on this account that fats are always more palatable as well as digestible in cold weather than in warm. Captain Hall, who spent ten years among the Esquimaux, and during the entire time was in excellent health, informed me that he attributed this to the fact that he adopted the habits of the natives,—clothing in furs, eating the pure raw fat of the walrus, and sipping, in lieu of tea or coffee, pure oil. Four or five pounds of raw meat at a meal was the usual quantity, which the stomach digested without any difficulty. The main food was thus almost pure carbon. On the other hand, in tropical countries, nitrogenous foods, or those which build up and repair the dark structures of the body, are what are chiefly craved,—such as lean animal food, green vegetables, and sour fruits. Experience has amply demonstrated this class of aliments to be the most conducive, under such circumstances, to a healthy state of the body. The inhabitants of the temperate zones feel the need during winter, though to a less degree, of the kind of food used by the Esquimaux, as well as during summer for the kind of food used by the residents of inter-tropical countries. To continue throughout summer or winter the kind of food appropriate only for one season, is to infringe what observation and science have alike shown not to be in harmony with the needs of the body for its maintenance in a healthy state.

The following table from Dr. Letheby, of London,

England, exhibits the proportions of heat-making food, the carbonaceous, and the repairers or builders-up of the darker tissues, the nitrogenous, in some of the articles in ordinary use. It should, however, first be stated that the proper ratio of carbonaceous to nitrogenous food, for those living in a moderate temperature, is about four to one, or very nearly that found in human milk.

Substances.	Carbonaceous.	Nitrogenous.
Human milk	11·4	3·5
Cow's milk	14·8	4·5
Skimmed milk	11·5	4·5
Buttermilk	6·0	4·5
Beef and mutton	12·0	19·0
Veal	2·4	19·0
Poultry	7·2	21·0
Bacon	16·8	0·8
Cheese	72·0	29·0
Cheese, skimmed	14·4	45·0
Butter	199·0	45·0
Eggs	25·0	14·0
White of egg	25·0	20·0
Yolk of egg	72·0	16·0
Salmon	9·6	17·0
Eel	19·2	10·0
White fish	2·4	19·0
Wheat flour	74·8	10·0
Barley meal	75·8	10·0
Oat meal	76·4	12·0
Rye meal	70·8	9·0
Indian meal	84·2	9·0
Rice	76·7	7·0
Haricot	52·2	23·0
Pease	62·8	22·0
Beans	47·4	24·0
Lentils	47·6	29·0

Substances.	Carbonaceous.	Nitrogenous.
Wheat bread	51·4	9·0
Rye bread	48·4	5·3
Potatoes	23·5	2 0
Green vegetables	5·0	2·0
Arrowroot	82·0	2·0

It will be seen that a meal of wheat bread, butter, bacon, and potatoes has a large proportion of the carbonaceous element in it, very well adapted for the coldest season of the year, but badly adapted for the warmest, or even for those who in winter spend nearly all their time within doors and in a high temperature. The inequality of the two kinds of food is usually yet further increased by the free use of sugar and lard in compounding certain dishes. Neither of these substances contains nitrogen, but they are very rich in carbon. Such a mode of nurturing the body is well enough suited for the Laplander, but it is unsuitable for the residents of climates where the summer temperature ranges from 65° to 90°. During summer the bacon and lard should be omitted, and fresh lean beef, fish, or poultry substituted. Butter and sugar should be used sparingly, while green vegetables should enter as largely as possible into the composition of each meal. The intense longing, so common in spring and summer, for acids, sour fruits, green vegetables, buttermilk, and bonnyclabber, are clearly expressed indications of an excess of carbonaceous material in the blood, and of the need of acids to thin it down. Nitrogen is also needed to replace the carbon, and so prepare the body to endure without harm a great increase of external heat.

To feel well during the spring season, it is therefore necessary to eat no fat meat, gravy, or lardy pastry, and very little butter, cream, and sugar. The food should be principally vegetable, and less in quantity than ordinary. This course of diet should be commenced just as soon as the warm days of spring begin, and strictly kept up all summer, except by those who perform a great amount of out-door labor. In this manner the necessity for taking purgatives, and the so-called blood purifiers, every spring, will be obviated, and sick headaches and bilious attacks prevented.

It may occur to some, that if the natural cravings are competent to determine what the body needs for its own benefit, what is the use of writing at all upon the subject? Simply for the reason that many of our natural cravings are unheeded, and that others are for foods prepared in such an artificial manner that they excite what they are intended to do,—an unnatural appetite. The craving for such artificially prepared foods, like artificially prepared drinks, is about the same the year round; while for those in a more natural state it varies with the seasons. The one has its origin in the varying needs of the body; the other, in a constant desire for palatine pleasure.

LEADING PRECEPT OF GOOD COOKERY.

When food is so unskillfully cooked as to be less palatable than ordinary, it is usually supposed to be specially unwholesome. Many popular writers

attribute nearly all indigestion to this cause, making such cookery a butt for their wit, wisdom, and satire. They commit the mistake of confounding deliciousness with digestibility. Though these qualities are usually united in foods compounded in nature's laboratory, they are seldom united in foods compounded in the kitchen laboratory. A good cook is not one specially skilled in compounding and preparing delicious dishes. Such cooks are usually the worst. The kinds of food they commonly prepare are too refined, too rich, too complex; and therefore indigestible and unwholesome. The fundamental precept of good cookery is not the refinement, concentration, and complex mixing of food, but simply the skillful application of mechanical means and heat to aliments in their natural state. This is its true physiological application, or, in other words, the process which prepares and commences the digestion of food for the stomach. For example, the application of heat to an apple blunts its sourness and mellows its structure, so that there is that amount of labor saved to the stomach. The gastric juice cannot act upon it until its structure is broken up, just as heat breaks it. But if the application of heat to the apple be continued, with the addition of cider or sugar, and spices, until it is much reduced in bulk, and made into a strong butter or sweetmeat, the effect is nothing like commencing the digestive process. In reality, the prolonged application of heat to the apple in this manner has just an opposite effect,—it causes the sweetmeat to resist the digestive

energies of the stomach. Those not possessing very strong digestive organs, who have ever consumed such a butter or sweetmeat, will testify to the difficulty of its digestion. It is health-destroying, unwholesome, and therefore very bad cookery.

BREAD.

The true sphere of art in the preparation of food for the table is admirably illustrated in making Graham biscuit.* The entire wheat kernel is ground but little if any finer than what the molar teeth can do; the unbolted flour is then mixed with water and subjected to the action of heat There is no taking out of the shell of phosphates, which nourish the brain and bones, and the comparative coarseness of its substance insures a speedy penetration and action by the gastric juice. The remainder, after digestion, is sufficient to make the bowels feel its presence, and so secure their regular action. There is no partial decomposition and loss of substance, as there is by the action of yeast; the bread is never sour, but always sweet, wholesome, and economical.

This kind of biscuit should be eaten warm with a

* As the mode of making Graham biscuit may be unknown to many, the process—a very simple one—is given here: Procure a set of small oval baking-pans made of cast-iron, holding each about two tablespoonfuls; make them almost baking hot, butter lightly, then fill with thick batter, made of unbolted flour and cold water (without salt), thoroughly beaten. Bake as quickly as possible, in a hot oven. Bread made in this way is light, and will usually agree better with dyspeptics than any other.

little butter. The coarseness of its texture allows the gastric juice to mix quickly with every particle of its substance, and so prevents that difficulty, so commonly experienced, of digesting other forms of warm bread made of fine flour. A lady, the daughter of a physician, having the weakest and most sensitive stomach I ever saw, can eat no other kind of bread without creating great distress. Stimulants and tonics of every kind, even in very small doses, irritate the stomach to an extraordinary degree. After many years of suffering, and after availing herself of the best medical advice, she has found that the only possible way to avoid suffering is to live upon three or four Graham biscuits a day.

Crushed or cracked wheat, not deprived of its bran, cooked like rice, and eaten with cream and a little sugar, is at once cheap, wholesome, very nourishing, and agreeable to the palate. As a dessert, especially for children, nothing can be better. Those who prefer to use ordinary yeast-raised bread, should not use only fine flour in its composition. At least a handful of the unbolted article should be added for each loaf, as in ordinary brown bread, and without the addition of sugar. This renders it easier to digest, more nutritious, and prevents costiveness. Corn bread, when not made very rich with butter, lard, and sugar, is very wholesome, especially during the winter season, and for laboring men. The larger proportion of carbon or fatty matter which this variety of bread contains, makes it more heating than the wheaten.

In preparing any other natural product for the table, the same avoidance of undue refinement and intricate mixing should be observed. Mastication and digestion may be always facilitated by grinding or exposure to heat; ever remembering that the foods compounded by nature are invariably better adapted for the nourishment of the body than those prepared in accordance with the pretentious and seemingly wise rules of art.

The only exceptional case, in which it is an allowable convenience, though doubtful if any better for the stomach, to improve upon the natural product, is in the use of sugar instead of the juice of the cane. To partake even of this in any great amount is hurtful to the stomach; yet when judiciously employed, as in the correction of the excessive sourness of fruits, its use is advantageous. Eating sugar in any form in large quantities is always detrimental to health, and, like the devouring of trashy novels, destroys the taste for more wholesome nutriment.

ANIMAL FOOD.

As a rule, wild animal food is more digestible and wholesome than tame. The wild generally contains less fat than the tame, especially during spring and early summer. And this leanness, at these times, is as it should be. The need of our bodies during these seasons is not for much heat-making, but for plenty of muscle and nerve-making food. Whatever kind of food is a real need of the body,

that kind is always more digestible. A man while living in Greenland can easily digest an amount of fat which would cause him immense distress while living in Florida.

Pork is the most indigestible and unwholesome of all our meats. Except for laboring men, and during the intense cold of winter, there is far too much fat in it. On account of the confinement to which the hog is subjected, and its filthy habits, the meat is very often diseased. Measles, scrofula, and trichinæ are some of its ordinary maladies. I have frequently seen diseased lumps in its liver, or its kidneys almost disorganized, and yet the flesh appeared fat and good. Good it cannot be, under such circumstances; though it is put upon the market as such. The safest rule is, never to eat the flesh of this filthy brute. Those who choose to do differently, should be very particular to have its flesh thoroughly cooked before eating, in order to destroy all the trichinæ which may be in it. Beef and mutton are the most wholesome and digestible of our domestic meats, yet not more so than poultry. Eggs, fresh fish, and oysters have only to be named to be commended as excellent kinds of nutriment.

Boiling, broiling, roasting, and baking are the only proper ways of applying heat as a digestive agent. Frying, except when skillfully rapid, and with only butter enough to prevent sticking to the vessel, has the effect of increasing instead of diminishing the difficulty of digestion.

WHEN AN UNRIPE VEGETABLE DIET IS WHOLESOME.

The use of unripe, decaying, and diseased food is very generally recognized as a source of unwholesomeness. It is not, however, all equally injurious, nor the same article under dissimilar circumstances. Animal food is less so than vegetable, though some kinds of immature vegetables can be eaten at times not only without detriment but with marked advantage; as, for instance, during the early heats of summer, when the longing for something green and sour is quite strong. At such times salads, greens, or pie-plant may be eaten in moderation with advantage. Their fresh, cooling nature thins the dark, thick, highly carbonized blood of winter, and prepares it for the season of fervent heat. A desire for green and sour vegetables is often caused by excessive indulgence in fat animal food, sweetmeats, rich gravies, oils, and butter. If the blood is surfeited with these varieties of food, the desire for vegetable acids will be strong, and its gratification only serve to whet the appetite anew, to the still greater enriching of an already over-rich blood.

The use of immature food, under ordinary circumstances, does not conduce to health, but in conjunction with exhausted states of the body, serves to develop attacks of cholera morbus or diarrhœa. It is through these means that nature rids herself of large amounts of improper and indigestible nutriment. Of course, all diseased and decayed food, of whatever description, should be carefully avoided. Those who

are too imbruted not to do this themselves, should be compelled to do it by the enforcement of proper sanitary ordinances.

HOW AND WHEN TO EAT.

The manner and times of eating also deserve attention. Sufficient time should always be taken to masticate food thoroughly. The habit so common of hastening the swallowing of food by flushing the mouth with liquids, should be effectually corrected. It is a good rule not to drink at all until a meal is completed, or at least *only* when the mouth is empty.

When the diet is plain and simple, there is little danger of eating too often. The desire to eat frequently, or when there is no true hunger, is nearly always produced by some viand made specially to tempt the appetite under all circumstances. Persons then eat, not that they need food, but because eating is such a pleasant thing to do. Hunger is the only safe guide to determine when to eat, and the desire should not be habitually disregarded. In failing to satisfy hunger at the proper time, the appetite becomes ravenous, and so leads to excessive eating, or the sense of hunger wholly abates, giving rise to a deranged stomach and severe headache. Better to partake of a lunch, and so moderate the strong desire, until it is possible or convenient to eat the regular meal. It should also be borne in mind not to eat a very large or hearty meal at the close of the day, when the body is very much exhausted by

great external heat and severe labor. Acute indigestion, a restless night, or an attack of cholera morbus is the common result of such a course.

NUTRIMENT DURING INFANCY.

The practice of dosing infants, almost as soon as born, with sweetened water, teas, and castor or olive oil, is a relic of meddlesome, superstitious ignorance, —the sooner discarded by mothers and nurses, the better. Nature provides in the mother's breast the kind of food best adapted to the needs of the infant; watery and laxative at first, richer and more nutritious afterwards. By trusting to nature and her resources, and distrusting the fussy officiousness of meddlesome nurses, with their invincible desire to do *something* for little, tender beings, and, worse than all, to administer the so-called soothing-syrups, an immense gain to the welfare of infant life would result. When a babe seems to be in actual pain about its stomach or bowels, a little essence of peppermint in warm, sweetened water, or a spoonful or two of warm whisky-toddy, will usually give prompt relief.

The proper time for weaning is pointed out by nature in the provision of one or more grinder teeth for each jaw. Under some circumstances, as when the health and strength of the mother are feeble, it may be better to wean sooner. Cow's or goat's milk, diluted with a very little warm water, and made just perceptibly sweeter than natural, with the addition of a little pulpy bread, makes an excellent form of

nutriment during this period. The rule of plainness and simplicity requires to be undeviatingly followed throughout childhood. Concentrated sweets, such as candies, jellies, ice-cream, sweet cakes, rich puddings, sweetmeats, pies, marmalades, or butters made of fruits well boiled down,—in short, every preparation of food refined and concentrated, or made up of a complication of aliments, should be rigorously excluded, as wholly unfit to build up strong, symmetrical, and healthy bodies. Almost any ripe fruit, of natural bulk and composition, may be freely allowed, especially when the craving for it is strong.

On account of the activity of a child's nature, and the rapid increase of its size, food is required oftener, and in greater variety from meal to meal, than in adult life. Above all, for children, wheaten bread should not be made of flour in which there is none of the outward or branny part of the grain. Their rapidly-growing nerves and hardening bones require a larger blood-supply than ordinary of the elements in which that part abounds.

Aliments for the young should be mainly vegetable, but such as abound more in flesh and fat for the cold or winter season of the year. There should not be more than two or three dishes at a meal, and these should vary as the esculents appropriate for the season allow, or the inclinations may direct. A rigid adherence to this mode of nourishing the body in youth as well as throughout adult life, would result in an incalculable gain to strong development, youthful buoyancy, and robust life. But more especially

would a gain be realized in an immunity from all the inconveniences and miseries of a weak or disordered digestion.

WHOLESOME DRINK.

The strict hygienic rule of drinks is a plain one,—the use of *pure water* only. With the prevailing epicurean tastes, such a recommendation will not be received with favor, nor is it likely to be adopted. But as the aim here is not to write to please, excuse, or minister to prevailing tastes or practices, but to lay down the simple yet inflexible rules for the most perfect health of body and mind, the exact truth must be told, however unpopular it may be.

Water enters more largely into the composition of the human body than any other substance. It composes about three-fourths of the volume of the blood, and enters largely into the composition of all the tissues. The simple sensation of thirst is the best of all indications when, and how much is needed for the wants of the body. Every form of artificial drink fills these needs in an exact ratio to the quantity of water which it contains. Nature needs not, nor does she adopt, as in any way useful, the modification of liquids so ingeniously concocted and so commonly partaken of by men and women. The caffeine in coffee, the theine in tea, the alcohol in distilled and fermented drinks, are expelled from the body either through the lungs, skin, or kidneys, just as fast as the blood can move, and the excreting organs can act upon them, at their proper outlets. It should be

borne in mind, however, that while water is the drink for healthy persons, it may not be the best for the weakly or disordered. What form and amount of drink is best under the latter circumstances, is for the physician, not the hygienist, to determine. The rules which should be followed while in health for its preservation are often quite dissimilar from those which should be followed by the feeble, or those in bad health, in order to regain a natural or healthy standard. This distinction is very often disregarded, even in books professing to teach hygiene.

Soft water is more wholesome than hard; though water moderately hard is not perceptibly injurious. When very hard, a part of the salts of lime can readily be precipitated by boiling. The crust on the inside of vessels used for such a purpose exemplifies the hardness of the water of any well or spring, and the softening effect of that process upon it.

Water impregnated with chalk may be softened on a large scale by the method adopted at Canterbury, England, and described by Tyndall. Adjacent to the large reservoir is another containing pure slacked lime. This is filled with water, the lime and water being thoroughly mixed by air forced by an engine through apertures in the bottom of the reservoir. It is then allowed to settle until perfectly clear. A certain quantity of this is then introduced into the large reservoir, and afterwards nine times the quantity of the hard chalk-water. A precipitate of carbonate of lime is formed, which soon subsides, leaving water of extraordinary beauty and purity overhead.

As a rule, spring- and well-waters, if brought from deep fountains, are better and more wholesome than running streams. The water from the latter source is never free from more or less organic matter, either liable to, or in an actual state of, decomposition. Well-water, in towns and cities, unless brought from a great depth, is wholly unfit for drinking and culinary purposes. The immense quantity of organic matter, or solutions of it, which permeates every inch of the soil for a large number of feet in depth, precludes the possibility of water passing through it without being corrupted. Earth used continually for years as a filter loses its purifying properties, as chemical tests readily verify; although the water which passes through it may appear very clear to the eye and sweet to the taste. River-water, polluted by sewers, is as disgusting to the senses as it is destructive to health. The drinking of water from such a source has often been the means of spreading rapidly, in densely populated neighborhoods, a vast amount of those dreadful diseases, typhoid fever and Asiatic cholera. The municipal authorities who — through ignorance, political cowardice, or carelessness—neglect to remedy such a horrible evil, should be indicted by an enlightened public sentiment for gross incompetence, or for sacrificing the health and lives of their fellow-beings to their own ease or selfish aggrandizement.

Rain-water is the purest of all waters, when it can be obtained from a perfectly clean surface. This is not always practicable; in which case the impurities

may be extracted by running it through a filter of sand and charcoal. For drinking and culinary purposes it is then preferable to any other.

The notion that impure water can be rendered more wholesome by icing it, is an erroneous one. No doubt it is pleasanter to swallow any decaying or offensive substance cold than warm; yet when lodged in the stomach, the impure elements are quite as deleterious as they were before. The art, by the way, like many other fashionable alimentary arts, of rendering drinking-water, in mid-summer, of a mid-winter temperature, is of itself highly injurious. Ice-cold drinks in summer, while the body is greatly heated, are capable of producing lifetime disease, and even instant death. Too great caution under such conditions cannot be observed.

Tea, coffee, and fermented drinks are frequently useful as medicinal agents in the cure of debility and disease, but as agents to preserve the health of the strong and healthy, never. The effect they have of partially staying the waste of the body, may be of temporary advantage to brace it for a fitful and final effort under some exceptional and extraordinary instances of great fatigue, or exposure with scanty food. But beyond this, they are only interferers with, and derangers of, the perfectly natural play of the organic functions.

THIRD LAW.

ADEQUATE OUT-DOOR EXERCISE—ITS VIOLATION AND RESULTS.

MOTION is a necessity of animal life, and is of two kinds: that which is subject to the will, and that which is not. The motion of the heart, for example, belongs to the latter; the motion of the limbs, to the former. The involuntary motions are ruled by nature; the voluntary, by the will. It is only those under the will that are subject to abuses, and with which we have to do.

The will and the judgment are seldom animated by any motives to the exercise of the body save by those of convenience, necessity, or ambition. It is rarely convenient to take exercise for its own sake, but it is often necessary for other objects; and as this necessity varies from a nearly constant struggle to no struggle at all, it follows, that some persons take too much exercise while others take too little. This inequality is sustained and increased by certain improper customs and fashions. With thousands of weak-minded people, the marks of health and strength are thought to be vulgar, and systematic efforts are made for their destruction. The ruddy hue of health, the strong limbs, and the air of vigor are sought to

be exchanged for the bleached face, produced by close confinement in dark rooms, for really delicate health, puny limbs, and for an appearance of languid indisposition.

PRIMARY EFFECTS OF INSUFFICIENT EXERCISE.

To some persons there is, to a greater or less extent, a charm in a pale, delicate face; but to the experienced observer, the attraction is immediately overshadowed by a feeling of pity. All the artifices of broadcloth and cotton cannot drive away the thought that beneath the smooth outside are projecting collar-bones, with deep hollows above and below; that the angles of shoulder-blades are prominent and unsightly; that the ribs are so bare of flesh as to be readily counted by the eye; that the limbs have scooped-out sides, flabby muscles, prominent and knotty-looking joints; the whole forming a picture more calculated to arouse compassion than admiration. Such a lean, skinny skeleton is admired by no one when seen among the inferior animals, neither is it when once seen among human beings. Yet, such is the enchantment thrown around the imagination by the artifices of dress, that considerable experience is required fully to appreciate the grossness of the deception. In this way the art of clothing tends to foster a decline in physical perfection. Behind a mask is hid a repulsive sight; the indications of a starved nutrition. Strip men and women of their clothing, make them as naked as the despised savage

of our wilds, and the stream of walking skeletons on our streets would excite the same feeling as the sight of a poor, skin-and-bone horse, or some gaunt, half-starved-looking cattle.

THE BENEFIT OF RESTLESSNESS IN CHILDREN.

The growth and increase in perfection of any part of the body subject to the will, are, within certain limits, promoted in proportion to the amount *of use* to which it is put. As youth is the time during which the perfect and symmetrical development of body and limbs are effected, this period possesses a pre-eminence over all others in determining the future well-being. But such is the one-sidedness of our popular systems of training that it is difficult to find one having the care of children who has ever thought seriously or acted intelligently upon the matter. In proof of this, observe the systematic manner in which the playful activity of children is curbed as soon as they begin to walk. Nature has planted within them a desire for motion almost unconquerable. A child, while awake, is not of its own will quiet for a single minute. Is this extreme restlessness advantageous? has it been made a part of a child's nature for the wisest and best of purposes? or is it simply a manifestation of the old Adam in its nature? Strange as it may seem, even in this boasted era of superior knowledge, the latter opinion seems to be the one generally entertained. The pale, quiet, sickly child is thought to be so good, so quiet, as to deserve praise

for its very quietude; few seeming to realize that these traits are commonly nothing more than the signs of a weak and unhealthy organization. Physicians recognize them daily in the children of scrofulous and syphilitic parents; and while they cannot look upon such traits as an evidence of a saintly nature, neither can they consider those which are strikingly opposite as any evidence of a devilish nature; for, as O. W. Holmes truthfully remarks, "some children are born with a crook in the brain instead of in the back." The restraining of childish playfulness is thought by many to be the main thing in training a child in the way it should go. Very many think there is something bad about a restless, fidgety, noisy, whooping boy or girl. Angry looks, words, and even blows are freely used to compel the child to be quiet, and when this is effectually accomplished, the training is thought to be excellent!

There is no evil in the restless energy of the young; but, on the contrary, as experience shows, the very greatest good. Hinder a child from the innocent exercise which it necessarily requires in order that it may grow up strong, vigorous, and healthy, keep it quiet by cruel, rigid rule, and while it is so, its mind will be busy with thoughts of rebellion, or perhaps of some scheme to deceive or outwit. The argument here designed to show the good effects of encouraging rather than repressing childish playfulness, does not, of course, imply that there should be no curbing whatever. This would be making the observance of one rule, in the care of the young, to override all

others,—the one-idea principle; while the result to be sought in unfolding man's complex nature can only be accomplished by the timely observance of many. The thing to be done is, never to bring youthful training in habitual opposition to a beneficent law of nature from any trivial ideas of propriety, or from any of the whims of caprice or fashion. But this is precisely the system now quite popular in training the young. The model child is a quiet child, an old-acting-young child. To this mark fathers and mothers strive to bring their children. Especially for girls must there be no running, jumping, climbing, and loud laughing. The loud outcries which develop the voice and lungs are very ill behaved, the jumping and romping which develop the limbs are rude, and the playing in the bright sunlight is destructive to a finely-bleached complexion. Only certain quiet, genteel amusements for an hour or two are at all allowable, and then for the remainder of the day girls must sit in the house, and behave as quietly and demurely as some feeble, worn-out old ladies.

BAD EFFECTS OF SCHOOL CONFINEMENT.

Children about their sixth year are usually sent to school, where the restraint of playfulness attains its most extreme degree, and the foolishness of custom touches the verge of cruelty. The restraint of what are only evidences of a buoyant life and health, which the mother could not fully accomplish at home, and which is often a leading motive in sending a child to

school, is effected in the school-room under the rigid rule of the teacher. This rule, absolute over every form of childish liveliness, allows next to no movement of body or of limb for five or six hours a day. There is only one prescribed posture of unbending quietude, and to release an aching back or cramped tired-out limb is to incur a reproof, or a mark for bad deportment. Such a continued sameness of position, of unbending quietude, is without a parallel in the dominion of restraints, and this, too, over innocent, helpless children, whose inborn and wisely-ordered yearning for motion is as much a law of their nature as the desire, when awake, to keep their eyes open that they may see and learn.

The celebrated Hufeland long ago said, "Let a child spend the greater part of the day in gymnastic sports of any kind, and in the open air, where they are always more serviceable. This strengthens in an incredible degree, gives peculiar activity to the body, and guards in the surest manner against faults in the growth and formations of the body." He also said, with great truth, that the injury to children at school does not arise so much from the exercise of the mind, as from the confinement and impure air; and recommends that schools be kept in the open air during the finer seasons of the year. Six or seven hours of unbending sitting deadens the natural vivacity, and causes an unnatural and continued pressure of the bones of the spinal column on each other, until they often ache in an intolerable manner. Yet the pupil must continue in an upright position,

regardless of this sense of painful restraint, and fix his mind besides upon what is, too often, an unpleasing task.

A CAUSE OF CROOKED BACKS.

Examine the shoulders of the poor horses engaged in dragging canal-boats, and the skin will be found to be either raw, or scarred in spots where rawness has been produced. The reason why they suffer more in this respect than other beasts of draft, is on account of the steadiness of the pressure upon one spot. Now, this same condition is a leading cause why so many children get crooked backbones. They are compelled to sit for hours in one posture, all the weight of the body on the soft and tender bones of the spine, until it aches, inflames, and ulcerates. It is stated, by competent authority, that in the larger cities nearly one-half of the female pupils have crooked backs; largely the result of the severe and long-continued constraint of the school-room, with the consequent lack of sufficient out-door exercise. The evils that flow from this deformity in after-life are fearful to contemplate. No one, except the physician, can have a full conception of them.

It is a standing complaint of school-teachers that the attendance of pupils is too irregular for educational advancement. The fact is seemingly lost sight of, that many boys and girls cannot attend with regularity simply because the restraints and requirements of the school-room destroy their health. There are few if any parents who cannot detect a falling off in

all the signs of strength and health in their children while attending school. Any observing person, but especially physicians, can see it in the diminished appetite, in the thinning flesh, the paling cheek, and a drooping of the usual animation. Not only so, but from five to ten per cent. of the young absolutely cannot attend school for any length of time without being sent to bed by some serious illness.

THE INVALUABLE TIME OF LIFE FOR LAYING UP HEALTH AND STRENGTH.

Even when boys and girls do not become positively ill by confinement in the school-room, there is a partial arrest, a temporary going backward, or a blasting of the expanding development of their bodies, on which depend the conditions essential for making robust men and women. It cannot be too deeply impressed upon the minds of parents that childhood is the *only time* for garnering strength, for unfolding the energies, and increasing the *constitutional grasp on life*. The venerable Dr. Erasmus Wilson, of London, says, "Youth, it cannot be too often repeated, is the time for storing health, both physical and moral; and every act which can in any way impede or frustrate this all-wise intention of nature will tend to lay the foundation of a weak and imperfect body, and shorten the days of its possessor."

By stunting the growth and development of the body *at the only period when growth and development are possible*, an injury is wrought which can never be

repaired; or, in other terms, there is a setting backward at the only time of life when a going forward is possible. The real meaning of a falling away of the strength, flesh, and health is very different in youthful days from what it is in adult life. During the latter period there is no storing process going on, only a simple using up of what is on hand; while during the former period there is not only a using up of the slender stock on hand, but an arrest of accumulation at the only period when an accumulation is possible.

Crooking of the spine is not the only disease developed by this bad system of restraint. By forcing the mind to over-action and the body to under-action, by forcing the most tender and late-developing organ forward, and the most developed and earliest-acting organs backward; in short, forcing the one in advance, and the other to the rear of natural action, tends not only to check the growth, arrest the garnering of strength and vigor, but to bring on dangerous inflammations and degenerations of the brain.

BRAIN-WORK REQUIRED OF CHILDREN.

In our school system children are usually required to do as much, if not more, brain-work than the average intellect of the adult is capable of performing. The attempt to make them do as much or more muscular labor than a full-grown man, would be quickly perceived to be both hurtful and cruel. Yet they are really less capable of enduring great

brain than muscular strain. The brain, which is the organ of the mind, is much slower and later in acquiring its full working power than the muscles. The highest working power of muscle is between the ages of twenty and thirty; of brain, between thirty and forty.

A moderate use of any organ of the body promotes its strength and development, immoderate use wastes and wears it out prematurely. Especially is this true during the period of rapid growth. The life-power which should be expended in promoting growth, is spent in exhausting labor. No one would expect a colt made to toil all its days to make a good horse; and no one informed of the ruinous consequences of the factory system as carried on in England, would expect to see factory boys and girls make strong, healthy, well-developed men and women. Even under the most favorable circumstances, overworking in youth always gives an untimely appearance of age and decrepitude. There is no essential difference in the bad effects of a factory system for the muscles and a factory system for the brain. Taxing, goading, or stimulating either part to its utmost during the period of rapid growth uses up the energy in performance, which should be spent in growth. The brains of children who are overworked do not grow: no energies are reserved for manhood; hence their early and brilliant promise turns out in fruition to be of a very dull and commonplace character.

The attempt to make children perform a great amount of mental labor in the school-room is, fortunately, not

always successful. To a close observer, it is not difficult to see how very little time is really spent in attention to tasks, or that during the greater part of the time there is simply a make-believe attention. Put this moment and that glance, now and then really given to the studies imposed on them, together, and the time would rarely exceed one hour a day. Yet the body is kept quiet, deprived of its needful exercise, for four or five times that period.

EFFECTS OF INSUFFICIENT EXERCISE UPON THE YOUNG.

Children deprived of adequate out-door exercise are always delicate, pale, and tender; or, in a figurative sense, are like the sprig of vegetation in a dark, dank hole, — tall, bleached, tender, and spindling. They, like the stem and branches, are not toughened by motion, nor is the low grade of life in the blood raised by sunshine and pure air to a high standard of vitality. An inactive in-door life with the young is one of the most effectual ways of weakening the life of the body. It renders the growth unnaturally soft and tender, susceptible to harm from the slightest causes. It hinders the garnering of strength necessary for a long life, and gives the germs of disease a resistless power over an organization so weak and deficient. By causing a direct impoverishment of force in the citadel of life, it assures to the floating germs of disease, bred among reckless transgressors, an easy victory. Measles, scarlet fever, and diphtheria find among such a congenial soil, and run riot among

the elements of the body held together by so frail a thread. The grade of life-force is also reduced below the influences of sharp changes of climate; and hence such children are always at the mercy of the weather. Colds and coughs are standard disorders in winter, headaches and habitual languor in summer. It is a standing complaint with many mothers that their children are so delicate they cannot endure anything,—some of them being sick nearly all the time. Shield and guard them as mothers may, sickness, slight or severe, is seldom absent from their doors. The scape-goat for this result is the climate: if that was only better, they are sure their children's health would also be better. No, it would not be better: no earthly climate is good enough to preserve health and strength under such unnatural training. This same complaint about catching cold is, by the way, a standard one wherever such artificial modes of training exist. Those children not subjected to it, as in the families of the laboring classes, often dirty and imperfectly clad, seldom have colds, simply for the reason that for the greater part of the day they have the freedom of the streets. It is not the dirt, it is not the rags, *but the life-giving force of an active out-door life* that renders such children so strong and healthy.

NEGLECT OF OUT-DOOR EXERCISE IN ADULT LIFE.

In adult life, the proper exercise of the body should not be left to convenience or inclination, for

the reason that these are commonly ruled by the whims of fashion, the spurs of ambition, or necessity. Because it is not precisely convenient, because the weather is not perfectly favorable, because the dress is not unobjectionable, because the complexion may be injured or robbed of its whiteness, are some of the considerations which prevent not a few from taking out-door exercise,—considerations utterly unworthy to be placed in the balance against that strong and enduring harmony between mind and body, as well as of every other organic part, which renders mere existence, a joy, and a delight.

Concerning the influence of ambition upon the observance of this law, it is only necessary here to say that, in cities and towns especially, it completely overrides any consideration of this need of the body. The taking of out-door exercise is commonly looked upon as an unpleasing task, or simply as a mode of whiling away an idle hour. It is only those who have lost their health, and have tasted the bitterness of disease, who ever think of complying with this requirement of their nature. Those in the present enjoyment of a sound body and mind give no heed to the fact, that the means which tend to the restoration of health are far more efficacious for its preservation, or that the ounce of prevention is worth the pound of cure.

AN EVIL OF OUR SOCIAL SYSTEM.

By the existing divisions of labor, one class of men may be said to do all the thinking, another all the acting. With the one, muscular labor is the rule; with the other, the exception. The one has an acute intellect and a weak body, the other a dull intellect and a strong body. The one is liable to become sickly from a purely neglected or unused body, the other from an excessively exercised or over-strained body. This inequality is not natural, not in accordance with the laws of our nature. The tree always in a storm, and the tree always in a calm, are not natural productions. The one is knobby, scarred, and scraggy, the other over-soft, tender, and fragile. Strength, symmetry, and endurance can only be secured by a proper observance of all the natural conditions for which the organization of the body was originally fitted.

The physical development of savages is commonly far superior to that of the races of culture; and were they endowed with a high standard of intellect, would form the *beau-idéal* of what man should be. Corporeal and intellectual excellence are not opposed, but, on the contrary, are necessary to each other. The man broadly great and noble is not of a weak and faulty organization. One with a faulty or badly-developed body may attain excellence in one thing, may even be a marvel of genius in one or two ways, but in all others he is weak, deficient, unbalanced,

pitiable. The energies of life, of deficient manifestation in some ways, seem to be expressed in others, causing their unnatural development. Those who are thus unhappily constituted are usually very sensitive, eccentric, ardent, warm in their likes and dislikes, momentarily happy and hourly miserable. True, whole-minded greatness requires a well-balanced and powerful organization. This can only be acquired and preserved by adequate out-door exercise; and while attaining this, other objects even more desirable—health and long life—are attained with them.

WHAT MAKES THE FARMER BOY OUTWARDLY STRONG AND INWARDLY WEAK.

The mode in which civilized society now operates does not embrace a broad and symmetrical plan of culture. It is either partial or one-sided: some great strain upon muscle, or some great strain upon nerve. With those who make a long-continued and exclusive strain upon muscle, there is a great and constant drain of the forces of life from the inward to the outward parts; and if this occurs in youth, the muscles of the limbs will be unduly enlarged, and at the expense of organs upon the inside of the body much more essential to life. The lungs, heart, and digestive organs are in this way exhausted in their energies to supply outward expenditure in moving muscle and bone. From this cause, these organs do not, in the young, increase in size and strength in a true ratio to the bones and muscles. Hence, the farmer's boy, too

often reared in this manner, is a marvel of apparent strength; but his motions are slow,—awkward, ungainly power is their sole characteristic. In endurance, or in bottom, as it is called, he is not the equal of youths reared in towns and cities. This fact was clearly demonstrated during the late war: the latter, to the surprise of many, making the most healthy and hardy soldiers. In the farmer's boy the bones and muscles are large in size and powerful in action; but the inward organs, which supply the force to move them, having been put to it all their days,—having in short been overworked from youth upwards,—are themselves comparatively small and feeble.

EFFECTS OF AN EXCLUSIVE STRAIN UPON NERVE.

Business and literary men, who make an exclusive strain upon brain and nerve, commonly transgress to a dangerous degree this law of out-door exercise. Confined and sedentary habits soon render their bodies feeble, over-tender, and susceptible to outward changes. Headaches, torpid digestion, pale blood, irregular appetite, costiveness, piles, colds, coughs, and consumption are some of the ordinary results. By not gathering energy from pure air and the life-giving power of light, by not releasing the brain from a constant drain of its energy, but stealing for mental achievement the nerve-force requisite for blood-making, for muscular development and action, nervous diseases, low in grade and obstinate in character, are frequently developed. Neuralgia, intense

fits of depression, a disordered mind, apoplexy, palsy, congestion, diabetes, and softening of the brain are among the penalties incurred.

THE CAUSE OF AN EARLY LOSS OF BEAUTY.

But the evils arising from the transgression of this law attain their greatest extreme among women. Shut up in houses nine-tenths of their time, with either no exercise, or that which is of a limited, irksome sameness, they are, as a consequence, unnaturally pale, soft, and tender; their blood is poorly organized and watery; their muscles small and flabby, and the force and functions of their bodies, as a whole, run low in the scale of life. A spurious fullness is often seen in the outline during girlhood, which usually melts like snow under an April sun whenever the endurance is put to the test, as in performing the functions of a mother. The change in appearance from the maiden of one year to the mother of the next is often so striking and enduring that it is difficult to believe that we are looking on the same person. The round, pleasing shape is prematurely displaced by a pinched angularity, and an untimely and unseemly appearance of age. Travelers from other countries, who have had extensive means for observation and comparison, have remarked upon the great beauty of American women, and the early age at which it is lost. Some have ascribed this to the climate; but more intelligent observers agree that it is mainly due to a hot-house, enervating mode

of life. English ladies of rank, who, by the way, are celebrated for retaining their beauty even to a ripe old age, think nothing of walking half a dozen miles at a time; while American ladies would think such a thing "perfectly dreadful." If American women, so daintily and richly fed, will sit in dark and sultry rooms the livelong day, they must expect to bloom too soon, to hasten through this charming period,—at the longest in about ten years,—and for twenty-five years after, have the grim satisfaction of being thin, wrinkled, angular, and sallow.

THE MAIN CAUSE OF GREAT SUFFERING DURING CHILDBIRTH.

The disregard of this law by women works all that it does for sedentary men, and more. The duties of a mother, by those of a faulty organization, cannot be perfectly performed. The unusual drain upon those with little or no surplus energies wellnigh exhausts them, and gives any disease to which there is the least tendency a chance to show itself,—of which consumption is by far the most frequent. The womb, also, upon which the burden of reproduction falls, badly sustained by a low grade of life in the body, becomes subject to many disorders. Not more than one woman out of twenty escapes derangements of this part in some form. What is suffered in this way only physicians can conceive and women realize. Then the pangs of childbirth, how terrible they are! Little wonder that women should quail before them; that they should shrink from becoming mothers, and

be tempted to resort to degrading and criminal means for the purpose of escape. Are the aches and pains of childbirth avoidable? To a great degree they unquestionably are. The tender mode of raising girls has a great deal to do with their sufferings at this period. Want of exercise renders the flesh soft and tender, and makes, in not a few cases, the development of the body unequal or faulty. The women of nations where she is not so tenderly raised, or where she takes a great deal of exercise in the open air, suffer very little, and some of them not at all, in this way. The hardy German peasant woman, who emigrates to America, and raises her girls on American soil and according to the American mode, or to an inactive in-door life, is filled with surprise and pity at their sufferings during childbirth. The wife of the Indian, who is the child of the open air, sunlight, and labor, stops a short time in the rear of the trail to give birth to her child, and then follows on as if nothing unusual had occurred.

Furthermore, the pregnant woman who scarcely stirs in or from the house,—having all the while an unusually good appetite,—expends none of the riches of her blood in exercise, but all upon the embryo, giving it in consequence, at the period of birth, an unnatural and often disproportionate size. In quite a large number of instances this is the reason why luxurious and sedentary women suffer much more than others during their confinements. A similar result, from a like inaction, is known to happen to kine by well-informed cattle-breeders. In the older

countries, where kine are stabled a large part of the year, their moanings, often rising to loud lows of distress, are nearly always heard during their struggles to give birth to their young. In a state of natural freedom such intense suffering is very rarely manifested.

In order to be exempt from the sufferings so common to the civilized female, it is not necessary to copy the habits of the savage, or of the rude peasant. One thing, however, is indispensable, and that is, to take habitually far more out-door exercise than is usually the case. It should be of as many forms as possible; and especially must this rule be observed during the years of youthful development.

TOO LITTLE EXERCISE CAUSES AN UNTIMELY DECLINE OF HEALTH AND STRENGTH.

The loss of youthful attractiveness is a small part of the evils incurred by the violators of this law. The course of life which brings on so speedily the marks of age, is just as effective in bringing on the marks of disease. In reality they work together. Untimely marks of old age are but the outward signs of the failure of the inward parts to carry on, in a vigorous and perfect manner, those series of actions upon which depend a beaming eye, a fresh, clear complexion, a pleasing, round figure, and a lithe, graceful vigor in every movement.

An indolent in-door life tends to beget a fading, slow-dying state of the body. This is manifest from the dusky, wrinkled pallor, the falling away of the

habitual energy, and the decreasing ability to endure and recover from any ordinary exposure or fatigue. Very rapidly, in some instances, do these increase. The strength, energies, color, and tone get worse and worse, although the appetite and digestion may be as good as ever. Active exercise, pure air, light, and oxygen are needed to work up to their full energies the gross particles of matter of which the food is composed. Except under the influence of these agencies, it is impossible for foods to ripen into well-developed muscle, blood, nerve, and bone. If the stomach is vigorous, the food may undergo the first stage of the change in form towards the high type of organization found in man, but there the process ceases, or it passes through the other stages in a feeble and imperfect sort of way, only to melt and degenerate prematurely into dying hurtful matters. These derange the whole body, and encumber, task, and damage the organs whose function it is to expel them from the body. So neither flesh nor strength is gained, although large quantities of the richest and most digestible foods are daily taken into the stomach.

It is under such circumstances that that deadly disease, consumption, commonly takes its rise. The most eminent of those who have made the subject of disease their life-long study, are of opinion that the lack of sufficient out-door action plays a prominent part in the development of this disease. The superior purity of lung-food to be found in the open air, the life-giving influence of sunlight, and the increase of energy and of strength by lively motion,

are all lost to the steady occupants of the dark, stagnant air to be found within solid walls. Says Dr. Fuller, of London, "Modern research has tended to show that the vicious habits of civilized life, the confined atmosphere of the dwellings, the want of sufficient out-door exercise, the various depressing passions, and the exhaustion of mind and body resulting from the anxious struggles and vicissitudes of life, have far more influence than wet and cold in preparing the way for the inroads of consumption. Even when the disease is already developed, or far advanced, the pernicious effects resulting from over-caution in respect to exposure to atmospheric vicissitudes are often painfully apparent. Nowhere is this more strikingly exemplified than at our large hospitals, where the consumptive out-door patient, who, ill clad and often ill fed, in hot weather and in cold, in wet days as on dry, has come to the hospital twice a week for medicine, notoriously lives far longer than his brother, who, more fortunate in being well fed and protected from the inclemency of the weather, is shut up in the equably-heated wards of the hospital, and thus loses the bracing, invigorating stimulus of the fresh breezes of heaven."*

Says Professor Flint, "Want of exercise, defective ventilation, deficiency of light, and the depressing emotions undoubtedly contribute to the production of the tuberculous cachexia. . . . I would rank exercise and out-door life far above any known remedies

* On the Lungs and Air-Passages, p. 368.

for the cure of the disease. There are grounds for believing that the advantage of a change of climate mainly consists in its being subsidiary to a change of habits as regards exercise and out-door life. So deeply impressed am I with the correctness of this view of the regiminal management of this disease, that I cannot express myself too emphatically in trying to enforce its practical importance."* Dr. Condie remarks, that "since more attention has been paid than was formerly done to the collection of correct statistics, consumption has been shown to be a disease rather of civilized life than of locality or climate." Besides hereditary influence, he names as the causes of the disease, "long-continued sedentary occupations, in-door confinement, particularly in narrow, ill-ventilated apartments, insufficient nutriment, close mental occupation unbroken by relaxation and active exercise, anxiety of mind."†

Dr. Aiken says that the broadest fact established regarding the exciting cause of scrofula is, that the domesticated animal is more liable to scrofulous disease than the same animal in a wild state. The stabled cow, the penned sheep, the tame rabbit, the monkey, the caged lion, tiger, or elephant, are almost invariably cut off by scrofulous affections,—no doubt due to deficient ventilation, and the abeyance of normal exercise of the pulmonary function."‡

---

* Practice of Medicine, p. 245, 250.

† Trans. Amer. Med. Assoc., 1850, p. 85.

‡ Science of Practice and Medicine, vol. ii. p. 234.

MODE OF OBSERVING THE THIRD LAW.

What constitutes an adequate amount of out-door exercise for a child, may be left ordinarily to itself. As before remarked, the prime reason why so many children are pale, puny, weak, and sick, is because their natural desire for exercise is constantly controlled. During their most tender years they are compelled to spend many hours in inactivity, whereby the natural energy of their bodies is kept down and dwarfed. Their muscles do not grow, but remain soft and feeble, until there is an indisposition, sooner or later, to take any part in lively out-door amusements, or they fall into a sort of dreamy stupor. No sooner does a child, *of its own will*, become as quiet and sedate as the parents had enjoined, than the latter take alarm, and are confident that something must be wrong. Very seldom do they realize that this is a genuine result of the restraint systematically placed upon natural activity, and that they are the true originators of the evils they fear and deplore. Worthy of imitation and full of profit is the instinctive behavior of animals to their young. Entirely unrestrained in playful, joyous motion, their forms display the finest types of healthy development, every action overflowing with elastic vigor.

THE ALLOWANCE OF OUT-DOOR EXERCISE FOR CHILDREN.

It is, other things being equal, the most carefully-housed children who are oftenest sick, and not those little, dirty, neglected ones continually on the street. The street may not be the best place for good moral influences, but its activity and sunlight are immeasurably the best for health and development. And, as it is usually possible to correct the former and seldom the loss of the latter, it is better to allow some freedom on the streets, where there is no other suitable play-ground, and trust to an increased effort in home-influences to counteract the harmful ideas and language they may acquire. There is no other way of making strong, active, and well-knit bodies, and robust men and women. An hour or two each day is not enough, but they must be allowed to spend nearly all their time in out-door amusements. Only when the heat or cold is extreme, or during rainy weather, should any restraint be put upon their out-door inclinations. The bodies of little ones, of course, should always be suitably and adequately protected, and in accordance with the recommendations under the mode of observing the fourth law.

INFANTS—WHEN TO BE TAKEN OUT.

The practice of taking an infant out-of-doors should be commenced when it is about six weeks old. The first exposure should be on a temperate,

genial day, for half an hour or more, and kept up systematically and in lengthening periods afterwards, —except under unfavorable circumstances. Infants instinctively manifest their delight with this practice. Their fretfulness is soothed, and they show by sundry kicks and crows how great the pleasure is to them. It is not best to be too cautious about the weather, only attending to the proper protection of the body. A nipping, raw, cold air should be no obstacle to the daily airing of an infant after it has attained its fourth or fifth month. For the benefit of timid mothers, it may be stated that these directions are not dictated by any theory, but by observing as a father and as a practical physician the admirable results which have grown out of the observance of these rules.

The out-door exercise allowed during attendance at school is lamentably small, and the amount of brain-labor exacted lamentably great. Many a promising, precocious mind is blasted in this way in early life. To exercise the brain is well; but whenever its labor becomes excessive, the development of the mind is stunted, just as the development of the body is stunted by excessive labor. The amount of brain-work exacted of pupils in the school-room is undoubtedly as great as most men and women are capable of performing, if not greater. Imagine the young gathered together, and, under the direction, frowns, and approval of masters, required to do as much, if not more, muscular labor than an ordinary man or woman could perform, and the common judgment would condemn it as cruel, injudicious, and ruinous.

Such a conclusion is more quickly formed in the one case than the other, on account of the ease with which the relation of cause and effect can be perceived. Yet the comparison, if anything, lacks in force. It is a physiological truth, that the brain-power of boys and girls is not as early nor as fully developed as their body-power. The brain increases in strength and endurance until about the forty-fifth year, while the muscular system ceases to grow and reaches its greatest power and endurance about the twenty-fifth.

With adults, a continued and deep centring of the mind on any one subject, for even two or three consecutive hours, is a very difficult thing to do, while with children it is simply impossible. It is well that an attempt to make them do so does not succeed, or that their minds can so successfully play truant three-fourths of the time, in spite of all the watchfulness of the teacher, the stimulating inducements offered, or the threats to which they may be subjected. With the strong and fully-developed brain, a constant and deep application of the mind to a single subject is a very frequent cause of disease, especially of insanity; and this centring of the mind on a single theme continues into, and forms a well-known feature of, the insane condition, as for instance, on religion, on love, on riches, or on business of some kind,—a cause of insanity, by the way, arising from our social scheme of a great subdivision of pursuits, which has not received the prominent place it deserves.

PROPER DIVISION OF TIME FOR BRAIN AND MUSCLE EXERCISE WITH THE YOUNG.

A well-considered division of time, for improving the body and the mind, is a point of great importance in the care of the young. The excessive culture of the brain, with a thoughtless neglect of the body, especially in cities, and everywhere with girls, brings up the young into men and women with tender constitutions and diminutive bodies. The tendency is to produce to an excessive degree the nervous temperament, in which life is commonly made up of moments of excited delight and hours of depressing misery.

In accordance with what familiar experience teaches, the younger children are, the more commanding and needful are the claims of nature for much time to be spent in out-door amusements. For the youngest scholars, each thirty minutes in school should be alternated with thirty out of it; for the next or medium-graded age, each hour of study with half an hour of play; and for the highest or oldest grade, each hour and a half of study with half an hour of out-door exercise. To this end the play-grounds around school-houses should be large, pleasant, and provided with ample sheds containing suitable and sufficient appurtenances for gymnastic exercises whenever the weather is too inclement for sports in the field. Out-door exercise, when the weather is at all favorable, is always better than in-door. Mere

motion does not include all the benefits of exercise. The superior purity of out-door air and the life-giving power of sunlight should always be taken into account. The result upon the scholars would be a greater willingness to attend school, better health, an increased susceptibility to government, more vigorous bodies, more active minds, and retentive memories.

MORE SENSE SHOWN IN THE MODE OF RAISING ANIMALS THAN CHILDREN.

The long day's toil of the workshop, factory, or farm is no substitute for the lively and exhilarating plays of boyhood. The farmer is very careful that his colts and young oxen shall not perform any protracted or severe labor, from the well-grounded fear that it may injure their growth and symmetrical development. It is a great pity that parents are not influenced by a like consideration in the care of their children. The well-informed and judicious farmer never makes drudges of his young horses, but he has no scruple about making drudges of his boys and girls. As soon as they are able to handle a tool, or attend a machine, they are kept at work from morning until evening. Men in general seem to think that the kind of physical liberty necessary for the perfect development of the inferior animals is not required for their own species; that, in fact, strength and weakness, health and sickness, are somehow, or in large part, not of law, but of arbitrary ordering, over which they have little if any control. This

superstitious, overshadowing idea, preoccupying the mind, has done more than any other to prevent an enlightened recognition of man's duty to himself. It has caused him in an age of inquiry and of progress to stumble on, in reference to the way in which he should use himself, in ignorance, in misery, and in disease.

If the traditional notions and cruel restraints imposed by parents and schoolmasters on boys and girls, were only supplanted by a little of the common sense so successfully employed in raising the young of domestic animals, an immense gain to human weal would be the result.

OUTWARDLY STRONG AND INWARDLY WEAK.

The true rule to adopt in governing boys and girls is to let them *run* and *romp* as much as they please, when not engaged in some light and brief task appropriate for their tender years. Any muscle- or mind-labor imposed on them should always be of an easy and short kind, — no long-continued and severe exertion for hour after hour and from day to day. The old adage that "all work and no play makes Jack a dull boy" does not express the whole truth. It develops to a disproportionate degree the muscles under the control of the will, giving, under favorable circumstances, great size and strength to the arms and legs, and a large squareness to the bones upon which these muscles act. But, at the same time, the development and strength of the in-

ward and more life-giving parts are hindered,—drained, in fact, of that energy necessary for their own growth and perfection. From this cause, men are often seen having flat chests, comparatively small, feeble, and stooped bodies, large, clumsy arms, hands, legs, and feet; moving heavily and mechanically through their parts in life. They form striking specimens of that sort of training which gathers ugly, unnatural size, shape and force in the outer parts, to the dwarfing and weakening of the inner. In such cases, the lungs especially are apt to be disproportionately small and weak, rendering it an easy matter to exhaust endurance in the performance of any quick or nimble movements. Unless the lungs, heart, and stomach acquire a life, strength, and power equal in measure with the development of other parts, there results that state of the body known as a lack of constitutional stamina, or a comparative feebleness and lack of capacity to give out the forces necessary to repair injuries, throw off disease, and move without fatigue the cumbrous levers and joints of the limbs.

From these causes there was seen, during the late rebellion, a difference between the endurance of the young soldiers who came from towns, and those who came from the country; very difficult to account for, because so unexpected, and so little in harmony with prevailing notions. The show of strength by the farmer's son being all upon the outside, it is as striking as it is deceptive, and sufficiently accounts for their comparative inability to endure the fatigues and hardships of a soldier's life. This explanation, it is

true, does not agree with that given by many surgeons, "that the country lad is more tenderly raised, and more regular in his habits, than those of cities and towns."* So far as exposure to a hot sun, to rain and cold, and to labor habitually severe, or to what is vulgarly known as "hard knocks," the difference is all the other way: the farmer's son having far more of them than the young artisans, loungers, and clerks of cities and towns. The true explanation lies in the fact, that the internal and vital parts of the latter class had opportunity to grow and gather strength for the day of trial.

After a day of severe toil, the outward expenditure of life-power is often so great as to cause the *internal organs* to throb with excitement, completely destroying the ability to sleep, and leaving no surplus energy to spend upon digestion, internal growth and development. The well-known fact that severe and continued labor almost suspends the ability of the mind to pursue any profound channel of thought, is an evidence of the loss of power to which the internal organs are subjected by a large expenditure upon the external. So, also, is the fact that, after a day of severe and exhausting labor, if a large meal is taken, for the stomach to be unable to digest it is quite common, exciting an attack of cholera morbus, or indigestion, with a sour, fetid stomach and severe cramps.

From these facts it follows, that the labor performed

---

* U. S. Sanitary Memoirs, page 100.

by the young, whether of body or mind, should always be light and brief; more especially during the period of rapid growth. A large share of time should be left for recreation; to be spent in study, or in amusements, as the youthful inclinations may elect. It is true, that this mode of youthful training does not accord with the precept, so popular with many worthy parents, of raising children to strict habits of industry. To this it may be replied that, if labor for the accumulation of money is the highest and best end of existence, then the precept and its practice should not be opposed. But, if a uniform and complete development of the entire man, his organs of thought and action, as well as of the parts upon which depend a strong and enduring life-force, enabling its possessor, in being alike perfect throughout every part of the body, to fill any sphere of life, to resist all hurtful influences or accidents to which he may be exposed; in short, to make him as near a perfect man as possible: if these are better and more important ends than the accumulation of dollars and cents, then the observance of the laws upon which their accomplishment depends requires to have pre-eminence, whatever traditional ideas there may be to the contrary.

The period for performing and enduring without harm the greatest amount of muscular toil is after the growth is completed. Protracted and severe labor can then be safely undertaken,—only remembering that the body, like the mind, can be overtaxed by many long years of severe toil, and so bring on a

premature breaking down of its energies, or, in other words, render a person old and infirm long before his natural time of life.

OUT-DOOR EXERCISE NECESSARY FOR YOUNG WOMEN.

In a common way, during adult life, the harm arising from the transgression of the third law is far more from under- than from over-adequateness of out-door exercise. Especially is this true of young women. With the view of increasing their attractiveness, it is sought by an idle in-door life to bleach the blood and make the skin white, soft, and tender. The inflictions arising from this conduct are enumerated under their proper head, only here remarking that in nine out of ten cases true beauty by such a course is either actually diminished, or it is made to bloom prematurely and briefly, at most lasting only a few years. In accounting for such a result it is fashionable to blame the climate—true to the educated bent of the mind to place the responsibility for our ills upon anything and everything save ourselves. Keep a plant in a hot-house, in the richest of soils, where no rude breezes can twist its limbs, where no chilling wind can check its growth, and how rapidly and beautifully it grows! How soon, compared with what is the case in a natural state, does it bloom, wither, and die; how easy it is to bruise, how susceptible to injury from chilling winds, and how fragile under every rude touch! Just so is it with many young women. Nurtured on the richest of food,

secluded within the warmest of houses, their cheeks only touched by the gentlest of breezes, how soon they bloom into youth, at what an untimely period of life do they wither, how easy they are to chill, how susceptible to variations of every kind, how unfit for the trials of maternity, how sorely they are bruised by the buffetings of life; until, wan, withered, sickly, haggard, and wretched, with scarcely a trace of their forced, untimely beauty, they long for relief and rest in death.

Daily out-door exercise is indispensable for gaining the greatest and most enduring beauty, to speak of nothing better. It need not be toil, but in any kind of animated action; walking, horseback-riding, amusements, plays, skating, rowing, or out-door gymnastics. Whatever kind is pursued must be carried out systematically and perseveringly. A five-mile walk, or a ten-mile ride on horseback every day is not any too much for those of very sedentary habits; and though at first this may seem an almost incredible feat, yet a little perseverance will soon render it both easy and enjoyable. The small relaxed muscles will daily become firmer and larger; bestowing not only a beautiful and symmetrical outline to the limbs, but ease, elasticity, and grace to every movement. In-door exercise is not a true substitute for that in the lively shimmering air. The glorious vitalizing light of the sun, the purity and sweetness of the atmosphere, are not found within solid walls, with their dim light and stagnant air. Just outside of the walls are the inestimable elements, light and

purity, free, abundant, and cheap for all, and no one need go starving for lack of them.

The man of in-door toil, instead of seeking in his leisure moments to soothe or benumb his nerves with tobacco, or by pouring malt or distilled drinks down his throat, should seek purity with his family in the park, or in the environs of the city, or in the country, where only natural sweetness, beauty and innocence dwell. There, the appetites are not inflamed, the atmosphere not loaded with nerve and blood destroyers, the purest of motives not exposed to contamination; there, exist only such influences as are congenial to the cultivation and building-up of the purest, happiest, and healthiest emotions of which the human soul is capable.

OUT-DOOR EXERCISE FOR THE SEDENTARY.

The man or woman of sedentary habits requires not only two or three hours' exposure each day to sunlight and out-door purity, but also a moderate amount of muscular action. The human body, though composed of many parts, is a simple organism, all parts of which have the most intimate and mutual dependence on each other for the regular and proper performance of their functions. No part was made without its use, and in its use, not abuse by excess or deficiency, lies the law of harmony, of symmetry, of strength, and of health. Naturally, therefore, no one has the right to use any part of his body, as the brain for example, to the total neglect

of any or of all the other parts. Daily observation demonstrates the harm which ultimately results from such an interference with the physiological relation of the various parts. Very sedentary and studious habits cause the muscular system to become weak and flabby, and the brain to throb and burn with excitement,—the precursor of disease. Allow the brain, therefore, some rest each day, by warming up the muscles and skin through active, exhilarating exercise. Walking and horseback-riding are excellent and available means, far superior as health-promoters to in-door gymnastic movements.

The late Lord Brougham, who performed an amount of brain-work almost beyond belief, and who died at the ripe age of ninety years, was in the habit of taking daily on horseback a twenty-mile gallop.

Exercise in a gymnasium is far inferior as a health-promoting measure to almost any kind in the open air. It is also open to the objection of being too brief and too severe, and of simply causing an increase of muscular development. The mere increase of muscle, and, of course, of muscular power, is no measure of health or of sound organic parts. Muscle is only the shell of life; it does not generate force, but spends it. A moderate expenditure each day is beneficial, but an immoderate drain of energy for this sort of action is a well-known cause of disease. Acrobats, prize-fighters, professional gymnasts, or in short all those noted for great feats of strength and endurance, are notoriously short-lived. The great strain in trials of strength put upon the heart

and blood-vessels, injures their structure, and causes them to rupture or break, to the speedy destruction of life. Exercise is not beneficial in proportion to its severity, but, on the contrary, injurious. Whenever it is carried to such a pitch as to exhaust endurance in an hour or less, it ceases to be rightfully entitled a health-promoting measure.

Nevertheless, during inclement weather, or with persons in whom the muscles of the arms and chest are very defective, gymnastic exercise of a moderate character is far better than no exercise. But it should always be remembered by those seeking to preserve a high state of health in body and mind, that it is not only unnecessary but injurious to seek after the development and muscular perfection of a prize-fighter.

FOURTH LAW.

ADEQUATE AND UNCONSTRAINING COVERING FOR THE BODY—VIOLATION AND RESULTS.

The method of nature in protecting the bodies of inferior animals is capable of conveying a useful lesson to mankind. That it is most tastefully, neatly, and effectively accomplished, displaying extreme handiwork and most effective purpose, a very little observation is sufficient to show. It is admirably adapted for the various seasons and climates, and with the utmost simplicity and completeness. It is always easy, graceful, and unconstraining, and the mid-winter wearer of furs knows how thoroughly it accomplishes its purpose.

Take as a familiar illustration the covering of the horse. In the far north the coat of the native animal is always long and shaggy, while in the south it is short and silky. Upon those of the temperate zones it changes with the seasons, gets longer and thicker on the approach of winter, shorter and thinner on the approach of summer. When the day is very warm the hair lies flat and close to the skin, when it is cold it stands erect and furry; the precise states affording the least and the greatest protection against changes from without. It is uniform: one part of the body

is not covered with a threefold thickness, and another left wholly bare; one part is not thickly covered to-day, and uncovered to-morrow; a vital part of the body is never left bare to cool breezes while the limbs are encased with a double or triple growth. It is unconstraining: it does not interfere with the free play of the limbs, cramp or pinch the flesh, bind the motions of the chest, and hinder the flow of blood.

Man is not clothed by nature as she clothes the beasts of the field. The gift of reason seems to have brought, as one of its accompaniments, nakedness, as if to effect some equalization of endowments, and give scope and employment to the power conferred. The use that has been made of it in this respect has not been excellent. The models of nature have never been well imitated, much less equaled or excelled. A result to any great degree very different could not be looked for, when it is considered that the human mode of covering the body is mainly governed by caprice and fickle fashion. These look more to ornament than to use, they consult fancy more than fitness, and seek a vain adornment even at the risk of future evil. Such a mode of protecting the body is *all* that nature's is *not*, not well adapted to protection against changes of the seasons, or to climatic variations; not uniform over the body, and not unconstraining to the motion of vital parts. Even tender infants are clothed and made victims to fashionable vanity, or to short-sighted notions of hardening. Some parts of the body are left bare to chilling winds, such as the arms and chest, which all

of nature's models—not to mention the dictates of common sense—plainly teach ought to be always covered. It is in man to be capable of the stupid blunder of naked shoulders and chest, while other parts of the body are covered with layer after layer of clothing; it is in man to be capable of the serious mistake of a thick warm covering one hour, and a thin cool one the next, as well as to bind the body so tightly with clothing that its natural motions are impossible, the natural shape distorted, while over other parts the covering is made to stand away from the surface from two to ten inches.

FASHION—SOME OF ITS RESULTS.

By most persons, the leading object in clothing the body is adornment, not protection. The nap on cloth, the very part capable of affording the greatest protection, is carefully removed, and the thin highly-dressed remainder of the fabric is cut into garments for man, that he may go shivering through icy winds and over snowy fields. The style of dress supposed to be the most becoming is adopted by all,—the old and the young, the weak, the strong; even though it be of the most uncomfortable and unprotecting kind. The thin delicate woman, warmly clad in a warm dry house, goes out in the cold damp air, clothed in the airiest styles of fashion, either thoughtlessly ignorant of harm, or with the determination to risk all danger. The vain and giddy mother, when her child is to be publicly seen and most exposed to

a nipping wind, bares its arms and chest as if it were an insensate doll. The results of such behavior are highly injurious. A sudden arrest of perspiration usually ensues, producing colds, coughs, asthma, fevers, and inflammations of the internal organs. A suffering child, the doctor, an agonized mother, crape on the door, and an exhortation to resignation to the dispensations of Providence, are the common order of events.

THE GREAT DEVELOPER OF DISEASE.

Not a few men and women have brought upon themselves protracted suffering, or have shortened their lives ten or twenty years, by a foolish conformity to the worst follies of fashionable attire. Many a thoughtless girl, bright, clear and fresh with youth, whose delicate, almost transparent skin and pearly brilliancy of eye denote the consumptive predisposition, has, by passing in an instant from the overheated and stagnant air of the ball-room to the damp and chilling air of the street, clad in the thinnest of dresses, developed this terrible disease. The almost complete arrest of perspiration forces back impurities upon blood already weak and impure, and causes the sudden deposition of this unusual amount of impurity upon the lungs. Or, in those with strong lungs and blood-impurity of another kind, such reckless exposure develops an attack of inflammatory rheumatism. The extreme suffering that attends this disease, and the terrible mode of dying which sometimes occurs in youth, when the heart becomes

involved, no one save those who have seen cases of the kind can form any conception.

In short, whatever part of the body is naturally weak, whatever kind of blood-impurity exists, the action of cold upon the skin from insufficient protection will usually *bring it out.* When the constitution is strong, and the blood pure, the exposure is generally harmless; and even when they are not, the vital energies would have been able to keep the body in a healthy condition had it not been for the new load suddenly put upon them by the arrest of perspiration.

It becomes apparent, from these considerations, why disease is so frequently seen immediately after exposure to cold, and why this exposure is such a source of dread to those in delicate states of health. As an agent of disease, it is better appreciated than any other; simply because a diseased condition almost invariably shows itself on the heels of the cause. Yet it is only, in the majority of cases, a *developer* of disease, or a developer of the state of the body, just as light develops the image upon sensitive paper in photography.

The promptness with which disorder oftentimes follows exposure to cold, tends to give it great popular estimation as a cause of disease. On this account, the fear of harm by exposure to a little cold air amounts with many persons almost to a mania, and becomes itself a source of evil from the ill-judged and great precautions taken to guard against it. So fearful are some mothers that their daughters may

take cold, so fearful are some persons about themselves in this particular, that all out-door air is carefully shunned as something pernicious, except on the finest of days. Even then, the precautions against danger are so numerous, and the stay so brief, that the benefit derived is slight indeed. Such a mistake is an unfortunate one. The lack of out-door air and exercise becomes itself a cause of that which it is sought to prevent,—an extreme susceptibility to the slightest fluctuations of the weather. It is very much as if one debilitated by lack of food should keep quiet in order to guard against exhaustion. Let the food be taken, and the debility would not be felt; let the open air and exercise be resorted to, and the great liability to take cold would not be experienced. When the blood is thin, impure, and imperfectly charged with oxygen, it has so little force of its own that its changes are very readily influenced or controlled by those without. The slightest puff of air will cause a shiver; the slightest variation a cold, more or less severe.

THE EFFECTS OF COVERING AND UNCOVERING CERTAIN PARTS OF THE BODY.

The practice so common with many women and children of keeping the arms, shoulders, and upper part of the chest thickly and warmly clad one hour, and entirely bare the next, is a very hazardous one. How tender the skin is rendered by covering, may be seen by the action of a summer sun on a part of

it which is usually protected. It quickly inflames, and even blisters, when exposed for a considerable period. The action of cold on such parts is not less decided. The circulation of blood is no longer free and active, and the transpiration of the skin large. Only those with pure blood and strong constitutions, can expose the skin in this manner without developing disease. Bronchitis, sore throat, croup, asthma, lung fever, and rheumatism are some of the common results.

WHISKERS: THEIR USE.

The removal of the covering provided by nature for the jaw and throat of the full-grown man is unquestionably a source of disease. Neuralgia of the face and frequent attacks of sore throat are sometimes effectually prevented by allowing the whiskers to grow.

There is a physiological reason why man needs more protection in that region than the woman. He has not, as she has, a thick coat of fat just beneath the skin, which gives her greater power to resist cold. It is this layer of fat which bestows upon her a rounder body and limb than the man, as well as a greater power while in a healthy state to resist the influence of cold.

DANGERS OF INSUFFICIENT PROTECTION FOR THE FEET.

Inadequacy of covering for the feet is a well-known source of derangement. These parts, being farther

from the centre of blood-circulation, are less able to maintain their heat, and hence their natural circulation and transpiration, than any other region of the body. Drive the blood away from the feet by the application of cold, and it must go to some other part, producing engorgements and congestions often quite dangerous in their nature. Arrest by cold the sensible and insensible perspiration which is constantly passing out from the millions of pores on the feet, and it must be thrown out by some other organ, or the impure matters will be kept in the body, to its quick disturbance and the speedy development of a feverish condition. With those of a strong vitality, damp, cold feet do not produce unfavorable results to the same extent. A vigorous performance of the functions resists or overcomes the injurious tendencies. But, when the vital energies become weakened from any cause, the quick chilling, by the application of cold or dampness to those parts, is very sure to produce "a cold upon the lungs," arrest the menstrual flow, develop headaches, or even dangerous congestions and inflammations of the brain.

BALDNESS: HOW PRODUCED.

The destruction of the natural covering or hair of the head is in nearly every instance effected by art. For man, the hat is usually made heavy, thick, and air-tight. Not only are the deleterious exhalations from the pores of the head retained for hours in contact with the living hair, but an unnatural degree of

heat is gathered within the hat, and the free circulation of blood for hair nourishment hindered by a tight, unyielding band. Baldness is almost universally confined to men, and in them to the region above the hat-band,—a tell-tale spectacle. It is curious to see how few are thoughtful enough to read it aright. Among women, who do not wear such hats, and in either sex among nations whose only covering for the head is that provided by nature, this defect is not observed.

In the example just given of the destruction of the life of the hair by an improper mode of covering the head, an excellent illustration is afforded of the carelessness or heedlessness of mankind as to the way in which they use themselves, until disease makes its appearance. When suffering or deformity occurs, they are then all attention to the causes, and to the means suggested for relief. Before anything of this kind is displayed, a word of caution or of advice is like seed falling upon barren ground. It is only after disease occurs, that the majority of mankind will acknowledge that the transgression of this law or of that is of the slightest detriment to them.

TIGHT LACING: ITS CONSEQUENCES.

One more illustration of this truth is furnished in another mode of violating this law,—that of tight lacing. The compression and distortion of the ribs, lungs, liver, stomach, and bowels, effected by this vicious custom, can be comparatively well endured

so long as the young and elastic strength endures. When this begins in the least to fail,—as from a transient illness, from an injury, from hardships or exposure, from the assumption of maternal duties, or from the effects of age and declining strength,—disease in one or the other of these organs will be sure to show itself, usually of a most severe and fatal character. The victim commonly refers the occurrence of the disorder to a slight cold contracted only a few days before, or to eating a hearty meal, from which time the indisposition began to display itself to her consciousness.

A moment's reflection ought to be sufficient to convince the sufferer that either of these could not have been the true cause: for, for many years, she had been committing just such indiscretions, eating just such meals, and even worse, without any inconvenience as the immediate consequence. There must have been *something* more than the cold or the hearty meal at the bottom of the disease, and that something, in nearly every instance, consists in a long-continued abuse or misuse which has so impaired the vitality of the part that it is no longer able to perform its functions in a natural manner. The fact that the effects of maltreatment cannot always be immediately felt or seen, is no evidence that they do not exist. As already shown by observation as to the effects of pressure on external parts, time is required before a diseased condition is manifested. Teeth do not instantly decay from the improper regimen of a few days or weeks, nor do corns form on the feet from a

few days' severe pressure. In proportion to the lowness of the grade of life in any part, or in the body as a whole, and the protracted operation of the abuse, will be the earliness of the appearance of a diseased state. Extra drafts can be made upon the inherent capacity of the human body, as well as upon a machine, and with like results. The mere evidence, so far as our senses can discern, of present well-working, cannot be considered as conclusive of nothing wrong. The internal parts of a machine, like the internal parts of the body, hidden or not capable of inspection, may be rapidly and unequally wearing away in cog, pinion, flange, or joint, with no perceptible jar until the unexpected crash of a break occurs. Even so is it with those who bring unnatural influences to bear upon the machinery of life. The evil may not be immediately perceptible: the harm from violation is seldom instantly felt; but the exhaustion in the stock of life-force which directs and holds the parts to a unity of action, has been constantly going on. In course of time the constitutional endurance will be exhausted, and disease become manifest; constituting the crash, the break, which all of the physician's skill is often powerless to mend or to heal. As it is only the terrible effects of accidents to machinery which appall and cause the unthinking multitude to think, so it is only the terrible diseases and deaths which arouse inquiry as to causes, and arrest for the moment some form of reckless behavior. But the reflective—those not satisfied like the butterfly in skimming along the surface of things—will perceive the influence of long-

continued causes in suddenly developing disease, and so be wise and provident in time.

The evil effects of tight-lacing are not all nor always in the future. Signs of distress are often quickly apparent; the nose purples, the upper bowels emit croaking sounds, while the lower become unnaturally protuberant, the womb falls, and the breathing and the circulation of blood are so hindered as often to bring on palpitations of the heart and fainting; especially after a full meal or in a close and sultry atmosphere. The long-continued and tight pressure of corsets also wastes and impairs the natural strength of the muscles of the back; so that without the usual lacing there is a most uncomfortable feeling of weakness. The circulation of the blood in the lower part of the lungs, from the severe compression imposed upon them, becomes in an almost stagnant condition, producing languor and a painful sense of lassitude. Continue this constraint, and the cell-life of the lungs, liver, and stomach becomes permanently impaired, laying a sure foundation for disease in these parts whenever the constitutional strength and vigor begin to fail.

It may, as before remarked, be depended on as a law that the penalty for transgression not paid for in the beginning of life is sure to be exacted towards its close. The millions upon millions annually dying from disease, and long before the natural period of human life, are simply victims to punishment for some laws infringed. All are alike subject to this result of a breach of law, the old and the young, the

righteous and the wicked. There is no evasion, no atonement, no forgiveness, but the penalties are rigorously and inflexibly exacted of all, in part upon the transgressors, and in part upon those who derive a weak or imperfect constitution from them.

Thousands of women, after entering the married state, become so feeble, so dejected, so full of aches and pains, that they are almost permanent invalids; a burden to themselves, a source of painful solicitude to all around them. A state of health so wretched is not the result of chance, but it is as much the effect of broken law as the delirium tremens of the inebriate.

Among the consequences of youthful follies, none are more sad than those of tight lacing. The organs injured by it are those through which all the life and energy of the body spring. Crippled in their power by systematic compression, they are no more equal to their natural and energetic action than the compressed and distorted feet of a Chinese female are for agile movements. And, when parts essential to life are deprived of their natural and energetic action, declining health must be the result. Especially will this be the case when the strength is drawn upon in any unusual manner; as in performing the duties of a mother. The first trial of these duties has sent thousands of women to an untimely grave. Many a young wife, happy in the love of her husband, is no sooner a mother than she begins seriously to fail in health. Day by day she gets thinner, paler, weaker; while a suspicious, hacking cough every

now and then arouses forebodings. Medical skill to arrest the failing health proves unavailing. It is seen that her fondest hopes of life are withering away under the finger of death in her vitals; and that she realizes that husband and child will soon be husband and child to her no longer. Soon agony is wrung from many hearts at a parting so untimely; all and solely from previous, painful, vain and foolish transgressions of organic laws, of which tight lacing is frequently the chief.

Again, by the folly of tight lacing, and in consequence of its action upon the organs which elaborate blood, they are barely able to supply the ordinary needs of the body. When the need of blood is extraordinary, as during the period of maternity, nature is found to be unequal to the task. There is thus produced at such times a constant feeling of fainting weakness, a feeling as if there was not strength enough to walk across the room. What were once pleasant duties, become distressing tasks; and mere existence seems as if continued only by a struggle. Stimulants and tonics afford but a transient relief; and the tedious drafts upon the energies of a system scarcely able to meet them, give many a young mother an old, worn, and even haggard appearance. The child of such a mother, by the poor quality of the milk derived from thin, impoverished blood, is not properly nourished, and consequently is seldom well, and always cross and puny,—perchance soon to die, a real blessing to itself and all concerned. These are a few of the evils arising from this unnatural

practice; and it does seem that if young women were only brought to realize, even in an imperfect manner, a tithe of the misery and disease they are laying up for themselves at some period of life, they would abandon a fashion of dress that yields no good, but only present discomfort, future evil and unhappiness.

WOMAN NOT BORN TO MORE SUFFERING THAN MAN.

Women very commonly think their lot in life, compared with that of man, is one of far greater suffering; and that they are subject to influences which tend in a much greater degree to break the health, strength, youthful vigor and beauty. With the training and habits they have, the thought is a correct one; but with the training and habits they *ought* to have, it is an incorrect one. The difference is entirely conditional, not necessary. Nature's gifts are invariably adequate and complemental. She never makes a requirement for which there was not originally sufficient provision. All the insufficiency observed is of art, not of nature. The light of nature and of analogy does not support the opinion that there should be any less happiness and well-being among women than among men. In the animal world, there is no perceptible difference in the average good attained by the two sexes. One is not much earlier broken down and more subject to disease than the other. Indeed, were it otherwise, it would be difficult to reconcile the inequality upon any principles of justice or benignity. Such an at-

tempt concerning the inequality of the human male and female is not required. Any great inequality of good and of evil, or of health and of sickness attained by each, is plainly and exclusively of art. In the air breathed, in the sunlight absorbed, in the exercise taken, in the clothing worn, woman is far more the child of vicious art and custom than man. The very fountain of life, the blood, is not in him choked and stagnated by severe compression until the stomach, liver, and lungs have only a very imperfect action. This mode of infringing an organic law belongs almost exclusively to women; and imposes the penalty upon them in the same exclusive manner. Until they have purged themselves of this evil, and take adequate out-door exercise, and protect their bodies with clothing more in accordance with the requirements of nature; until then, their plea, that they are born to greater suffering than men, will have only an apparent foundation in truth.

EFFECTS OF TIGHT LACING ON OFFSPRING.

The impairment of the blood-making organs of the body by tight lacing has a most important influence upon the offspring. All the material for the growth of the fœtus, while in utero, is derived from the food which the mother digests. If this great function of life is imperfectly performed, either the mother or child will suffer, or, more commonly, both. It is partly on this account that so many infants perish soon after birth, and that many more are afterwards

sick, weak, and fretful. The grade of life-force in them is not only weak at birth, but the poor quality of nutriment derived from the mother does not tend to improve it. The consequence is that when they are seized by any of the diseases incidental to childhood their systems are incapable of much resistance, and death has an easy victory.

Tight lacing, long continued, really unfits nine-tenths of women for the duties of maternity. If the evils of the practice ended in their own persons; if they were the only sufferers by their own folly, the mistake they commit would not be so dreadful. It is an offense of the most heinous character to be instrumental in causing children to suffer long and terribly, or in bringing them into the world with constitutions so frail and so tender that the slightest indiscretion—the slightest atmospheric change—affects them with suffering and disease. That consequences like these oftentimes ensue from long-continued tight lacing, there is no doubt. They display in a strong light the inexcusable folly of following all the whims of fashion, and warn every reflective person of the duty of obedience to the laws of health by the strongest impulses of affection.

At first thought, it may seem unjust that the child should so suffer for the sins of the parent. But fully and rightly comprehended, this supremely-ordered plan of nature for governing and inducing those who know good from evil, and are free to choose between them, will be found to contain the greatest wisdom and beneficence. If it were not for the disability,

suffering, sickness, and premature loss of life which the transgression of organic law so often plainly brings, mankind would be far worse in their conduct than they are. Nothing so thoroughly tends to restrain the wrong-doer as the absolute certainty of punishment, either to himself or to those he holds dear. Once render it clear to a mother how she is a victim,—a sufferer for the sins of her parents,—and a more efficient observer of organic laws, a more earnest advocate that her children shall *not* suffer as she has suffered, it would be difficult to find. With all parents such considerations will become what they were designed to become,—powerfully determining motives to pure and righteous behavior.

CORNS AND BUNIONS: HOW PRODUCED.

The effects of constraining covering upon the feet, although a minor evil, should not be disregarded. The parts constrained not being essential to life, the results are more annoying and painful than dangerous. The hands are never affected like the feet with corns and bunions, for the simple reason that they are not subjected to long-continued and severe pressure by any artificial covering. Shoes or boots made very tight, with high heels, or so ill-fitting as to throw all the pressure upon one or two points, are sure, sooner or later, to develop such troublesome excrescences. A narrow or pointed toe to a boot, by pressing the tips of the toes of the foot closely against each other, causes them to become misshapen, or to override one

another. This necessarily produces a greater projection than ordinary of the joint at the root of the great toe, which must then receive all the pressure of the shoe on that part of the foot, causing it to inflame and still further to enlarge; or, in other words, to form a bunion. The wearing of high-heeled boots puts an unnatural strain upon the ligaments of the foot, tending to destroy its beauty and symmetry. The small bones of the foot are even in some instances by this practice partially displaced, which gives rise to a great deal of pain of a neuralgic character. The great elevation of the heel in the fashionable shoe also converts the functions of the muscles on the back part of the leg into those of simple tendons or cords. There is little or no rise and fall of the heel necessary in walking: so the muscles which form the calf of the leg, not being exercised, are made to dwindle away in a most unshapely manner.

MODE OF OBSERVING THE FOURTH LAW.

To secure the observance of this law, five points require attention: 1. Sufficient clothing for the protection of the body; 2. Uniformity of this covering over all its parts; 3. Adaptation to external conditions; 4. Lightness and easiness; 5. Absence of constraint upon the movements.

TEST OF SUFFICIENT CLOTHING.

1. There is no arbitrary or uniform rule by which the sufficiency of the covering for the body, under all circumstances, can be determined. Among adults, individual sensation is unquestionably the surest and best guide; though this, it is well known, is somewhat capricious, and very much under the control of habit. Yet the sensation of cold is an indicator of inadequateness, which should be heeded under all ordinary circumstances. In following the guidance of the sensations, it is not proper, however, to change the clothing upon every slight or transient feeling of heat or of cold. It is only when the change and the sensation of one or of the other are constant that an adaptation of the clothing is requisite. The body needs to be inured to the slighter changes while in its healthful vigor; or, in other words, taught within moderate limits a reactive or counteractive force of

its own, whereby its energies are developed and intensified. The man who has long been subjected to a hot-house uniformity of temperature has not been placed under natural conditions; nor has his body been taught adaptation to the natural changes amid which it was designed to live. So it arises that he is unnaturally sensitive, tender, and liable to derangement whenever unavoidably exposed to them.

The covering of the body, therefore, whether for the young or old, should not be hastily adapted to all the mild and brief ups and downs of the temperature, but only to those which are more permanent and intense, as in the change from autumn to winter, or from spring to summer. By following this rule, natural and healthy development will be promoted, and the only hardening process to which any one should be subjected duly enforced. It would be a fatal mistake, however, to apply this rule to those actually diseased, or even to those in very delicate states of health. The latter condition, by the way, is but another name for that state of the body in which there is either the taint, the feebleness, or the seeds of disease in actual presence

CLOTHING FOR INFANTS AND CHILDREN.

In earliest infancy the covering for the body should be more than usually protective, gradually thinning it down as the strength and adaptation of the body to its new circumstances increase. The best way to

do this is by several layers of light-bodied woolen flannel, fitted loosely to the body.

The clothing, subsequently, should neither oppress a child by heat, nor render it uncomfortable by cold. The practice of keeping boys and girls thinly clad, even during very cold weather, with the view of hardening them, is cruel and injudicious. It does not harden; for true hardening consists in that which promotes the healthful resources and vigor of the body. Neither of these conditions is augmented in any way by keeping a child shivering with cold the winter through. A complaint now and then of cold is an entirely different matter, often quite proper and natural; but for a child to do so habitually indicates inadequateness; which, if nothing worse, stunts its growth. To feel hunger now and then is natural and proper; but to hunger all the time is just like being chilly or cold all the time, and clearly indicates inadequateness.

CLOTHING FOR ADULTS AND THE AGED.

The great inequalities of temperature to which men and women are subject, render the proper protection of the body a very important matter. When it is an object to guard against a chilling or winter atmosphere, the garments designed for that purpose should be worn next the skin and fitted loosely to the body. The outside clothing may be made to suit the fancy of the wearer, but the under-garments are the ones upon which reliance should be wholly placed for

the proper protection of the body. The advantage of this method is twofold. The warmth of the body is far more effectively retained when the protective covering is next to it. Captain Hall said of his experience in the far north, If you want to freeze to death, just wear a muslin or linen shirt next your skin. When all the useful or essential clothing is worn next the surface of the body, the outside garments, being mainly ornamental, may then be changed without incurring any risk. The only important hygienic use which the outer clothing should be made to serve, is to keep penetrating winds away from the surface of the body. For this purpose the structure of the cloth should be made very fine and close. During the winter season, at least two pairs of under-drawers and two shirts made of light-bodied woolen flannel, should be always worn. Those who are very sensitive to cold, or in delicate states of health, should wear three of each. The advantage of two or three layers of flannel next the skin, is not in the weight nor in the bulk, but in the fact that each layer is a wall within a wall, holding warm air between them. Two pounds of wool put into the body of a single garment does not shield the body half as well as that quantity made into two, and then worn double. Let those who doubt this try the experiment.

Towards the close of life, or in old age, a return to the highly protective covering of early infancy is necessary. The disinclination so often met with among the aged to acknowledge that they need any

greater protection for their bodies than in the days of their youth, should be remembered. No doubt this partly arises from a gradual blunting of the nervous sensibilities in old age. But the ability to endure cold without harm at this period of life is very much reduced, as the great mortality among the aged during the winter months very clearly shows.

COVERING THE BODY EQUALLY.

2. To put layer after layer of covering upon one part of the body, and leave another bare, or nearly so, is a common and injurious mode of protecting it from cold. As before remarked, nature gives no example of such an absurd arrangement. To take the covering from the neck and chest of an animal, and put it over the waist and loins, would appear as monstrous as it would be cruel. Yet this is precisely what is often done by men and women with their every-day habiliments. Nay, worse: a part of the body thickly covered one hour is uncovered the next; and this without the slightest reference to external changes. It is admitted that the absurdity and injury wrought by the adoption of such kinds of fashionable attire, are not effectual bars to their use. Yet this is not a good reason for withholding all denunciation. Perhaps the day is not far distant when obedience to natural law will be as common, and be considered as obligatory, as that rendered to civil law. Nay, there is reason to hope that the obedience given, will, when rightly understood, exceed that given to civil law;

for the former has as its author infinite wisdom and beneficent design, while the latter has only finite and oftentimes very selfish design. Besides, the one may be, and often is, wrong in its requirements, working great injury to its followers, while the other never does: always providing, that the interpretation thereof is a true one.

Garments, in protective quality, should be uniform for the whole body, except over the head, where nature sufficiently shields herself. The arms should not, excepting during oppressively warm weather, be left uncovered, especially during infancy. At the latter period of life there is no capacity to judge, and to warn from the sensations of the danger arising from cold in its action upon the skin. The surface of the lower limbs, excepting the feet, does not need any greater covering than that of the upper; their greater distance from the centre of the circulation, while it weakens their power of self-preservation, to some extent, is overcome by the necessity for their frequent exercise. The muscular action of any part has the effect of accelerating the rapidity of the circulation of the blood, and of increasing its heat. The feet should be kept dry and warm by woolen stockings in winter, cotton in summer, with good thick-soled shoes or boots.

HEAD COVERINGS.

So far as the action of cold upon the head is concerned, the hair gives ample protection. Air-tight hats should not be worn, especially in summer, and

never in winter any longer than can be avoided. To shield the head from great heat, a light-colored hat, so constructed as to allow a free circulation of air, is what the requirements of health demand. Some seem to think that a constant change of air within the hat is effected by a few small openings upon its crown. In this way, a little of the heated air in the hat is allowed to escape; but this is all. So far as exposing the head to unusual sun-heat is concerned, the man who wears a hat of this kind gets more of it than the plants of rhubarb which the gardener incloses with an open-ended barrel to give them a more rapid growth. The openings for ventilation—the more the better—should be just above the hat-band, and upon one plane. During the great heat of midsummer, a few green leaves, or, what is better, a wet linen cloth worn inside the hat, will aid in warding off an attack of sun-stroke.

Those who wish to preserve the life and beauty of the hair to a ripe old age, should never wear a hat while within-doors. Such a covering is then not only injurious, but without the shadow of use.

APPROPRIATE CLOTHING.

3. In adapting the clothing to the seasons, we should be governed in our selection by the protecting quality of various textures. When very little is needed, as in mid-summer, smooth and thin fabrics are the most appropriate: such as linen, silk, and highly-dressed cotton cloth; when a great deal of

protection is required, only those which are thick and loose in texture, or fuzzy,—as in furs, cotton, and woolen goods, having a fine and thick nap on one or both sides. The weight of clothing is no test of its protecting quality. Indeed, all the coverings which shield the body most effectively against cold have the least weight, as in feathers, furs, and woolen fabrics made light and fleecy. For winter, therefore, fabrics having these qualities should be worn next the skin, and over the whole body. With two or three layers of this kind, the outer garments may be changed with impunity to suit the fancy. But on no account, during that season of the year, should these under-garments be laid aside so as to expose any part habitually covered. One after another of these under-garments may be laid aside, as the warm season of the year advances,—to be put on again as it recedes.

By adopting this method of protecting the body, a much greater sameness between the temperature in a house and out of it may be safely carried into effect. Plunging the body alternately in a hot-air bath in the house, and then in a cold-air one out-of-doors, a dozen or more times every day, is not the way to preserve health, but to destroy it. And this evil can only be avoided by adopting the rule of clothing the body more and warming houses less.

When unavoidably exposed to rain, or when the ground is very damp or slushy, the body and feet should be well protected from their chilling influence Water-proof clothes for the body, thick-soled shoes,

warm stockings, and water-proof overshoes, are what the plainest dictates of common sense direct.

SECURING LIGHTNESS AND EASE IN CLOTHING.

4. As already remarked, the weight of clothing does not indicate the degree of protection it is capable of affording the body. It is, however, a very prevalent error that the firmer and heavier winter-clothing is, the more warmth it affords; as if gutta-percha cloth was more retentive of warmth than flannel, or a gum overshoe than a woolen stocking-foot. Fine, loose, and fleecy are the true conditions for warmth. Nature's covering for the inferior animals, which have to endure intense or arctic cold, are all of this kind. The thick, heavy, impervious skin of the elephant is far less protective against cold than the light, hirsute covering of the polar bear.

The lightest and most highly-protecting furs are those taken from animals inhabiting the polar regions; but there is no covering equal in lightness, ease, and warmth to that provided for the feathered species. It is light, loose, and, as in the eider-down of the Orkney duck, very fine, and more fleecy than the lightest snow-flake. Acting upon the common error above referred to concerning clothing, mankind would have the fine hairs of the furred animal and the feathers of the bird smoothed down close and firm, or woven into heavy cloths and fitted *tightly* to the body, in order to improve their protecting quality. But nature teaches a much better philosophy, as may

be observed in her mode of protecting animals. The colder the weather, the more loose and erect do their coverings become; and this erectness is not an effect of the cold, but an admirable and instinctive provision of nature for increasing the efficiency of the protection. Observe the domestic fowl on taking to its perch on a very cold winter evening, and it will be seen to shake out its feathers in an almost erect position from the body, precisely as the hair on the horse, cow, and cat assumes a like position under the same external conditions.

In the manufacture of clothing designed to retain the warmth of the body, there is therefore great room for improvement. In that intended for cold weather, the nap, instead of being carefully removed, ought to be as carefully increased, or made as fine, thick and loose as possible. In this way, and in this only, can ease and lightness be united with a highly protective quality—emulating the models of nature and promoting the health and comfort of naked bodies. Two layers of this sort would be far more protective than four of the glazy, smoothly-dressed, heavy-bodied stuffs in common use. The drag upon the shoulders and the stricture of bands around the waist, in holding heavy masses of clothing upon the body, would then be measurably obviated,—a point of great importance to the comfort and well-being of the system: for the ability to carry a great mass of clothing is usually in the inverse ratio to the necessity for it.

In proportion as the clothing for the body is reduced in weight, do the conditions for rendering it

easy to the wearer increase. The necessity for a heavy drag upon the shoulders and hips, and for a severe stricture by bands around the waist or loins, can be obviated in no other way. The bodies of the civilized inhabitants of the temperate zone are more burdened with clothing than the inhabitants of any other region of the world. There is, of course, less need of warm clothing in the torrid zone, but a far greater need of it to the inhabitants of the arctic regions. The latter escape the necessity of wearing heavy masses of clothing by making from the furs of wild animals a single garment for the entire body, the whole of which is not equal in weight to an ordinary overcoat. It is undoubtedly within the compass of human ingenuity to make a much nearer approach to the perfection of nature's coverings for the body in three essential particulars: ease, lightness, and warmth.

NO NATURAL MOVEMENTS TO BE IMPEDED.

5. In the covering nature provides for her creatures, the absence of any constraint upon rib or limb is a very notable feature. Though man can never hope to equal her in this respect, he can make a far nearer approach than he now does. Instead of purposely binding the chest, compressing the feet, and hindering the free motion of joints in back or limb, it should be a study, in the art of clothing, to give them the most perfect freedom. Designed constraint, such as that of the waist, it is of course easy for any one to

correct,—the will, not the mode, being the obstacle in the way.

Some traditionary notions, it is true, are yet extant that the human body requires some support by clothing. Many nurses and mothers act upon this notion in clothing a tender infant. Bands and various wrappings are pinned tightly over the ribs and bowels, as if nature's walls were too weak to hold the organs within. The practice is both cruel and hurtful. All the wrappings for an infant should be adjusted loosely upon its body and retained in place by having them pass over the shoulders.

FIFTH LAW.

THE EXERCISE OF THE SEXUAL FUNCTION ONLY FOR, AND NO INTERFERENCE WITH, THE NATURAL COURSE OF REPRODUCTION—VIOLATION AND RESULTS.

THE obvious design of the sexual desire is the reproduction of species. Were it not for the pleasure attached to this function, and the love of children, reproduction would be arrested and the earth become uninhabited. The command to multiply and replenish the earth is ineradicably engrafted upon man's nature by the powerful influence of the sexual attraction. The pleasure attached to this function is simply to insure reproduction, and nothing more. The gratification of this passion, or indeed of any other, beyond its legitimate end, is an undoubted violation of natural law, as may be determined by the light of nature, and by the resulting moral and physical evils.

INSTINCTIVE USE OF THE SEXUAL FUNCTION.

Those creatures not gifted with erring reason, but with unerring instinct, and that have not the liberty of choice between good and evil, cohabit only at stated periods, when pleasure and reproduction are alike possible. It is so ordered among them that the

means and the end are never separated; and as it was the ALL-WISE BEING who endowed them with this instinct, without the responsibility resulting from the power to act otherwise, it follows that it is HIS LAW, and must, therefore, be the true copy for all beings to follow having the same functions to perform, and for the same end. The mere fact that men and women have the power and the liberty of conforming or not conforming to this copy does not set them free from obedience to a right course, nor from the consequences of disobedience.

CONSEQUENCES OF INDULGING IN ANIMAL PLEASURE WHEN ITS END IS IMPOSSIBLE.

Around this freedom of our actions, and the consequences arising from its exercise, revolve all our ideas of responsibility and of a right and wrong course of conduct. Reason was designed to overlook and guide this freedom, or to point out to us when an act brings benefit and when it brings injury. When an act uniformly brings benefit, it may be accepted as lawful; when it uniformly brings injury, as unlawful. Now, all our experience of the modes in which mankind use their own bodies exhibits this uniform result, that when man's superior gifts are habitually employed to show him how to augment and pursue animal pleasures for their own sake, and irrespective of the ends which these pleasures were designed to fulfill, harm or injury befalls him. This

has been shown to be true of certain kinds of food and drink which man prepares, and I propose to show that it is true of the way in which very many use the sexual function.

The end of palatine pleasures being to nourish and strengthen the body, and the end of sexual pleasure being to reproduce the species, it follows, from the considerations just advanced, that when the sexual function is diverted from its end, reproduction, or if the means be used when the end is impossible, that harm or injury should ensue.

That this is a common result from the misuse of the sexual function, the experience of every physician who has had sexual disorders under his charge will confirm. If this view of the proper mode in which the sexual function should be used be correct, it also follows that those creatures which do not make an improper use of it ought to be free from the evils to which those who do make an improper use of it are subject. The correctness of this conclusion is fully confirmed by two very striking and general facts. First: man reproduces his kind in precisely the same manner that many of the animal species do, but he can, and he does, separate sexual pleasure from its end, reproduction, and, consequently, his kind are great sufferers from a host of sexual disorders. Second: the animals which reproduce their kind precisely as man does have not the power of separating sexual pleasure from its end, reproduction, and hence they are free from every form of sexual disease. Even the attempts of curious students into the nature of

diseases to inoculate animals with the virus obtained from the infectious sexual disorders prevailing among human beings have failed. The only violator is, with justice, the only sufferer.

Moreover, if the evils which arise from pursuing an animal pleasure for its own sake, or of separating the means from the end, be conformable to truth, then those who do so to the most extreme degree ought to be the worst sufferers from the consequences. That this is the case, the slightest acquaintance with the physical condition of those notoriously libidinous in their behavior is sufficient to establish.

To those accustomed to ponder upon the cause of some of the worst evils which befall mankind, the thought will readily occur that the ability to pursue sensual pleasure to a greater extent than any other creature does not confer the right, nor does it carry on its face any evidence of its lawfulness. On the contrary, the possession of high endowments by man might well be considered as pointing out to him the pursuit of high ends, not to show him the way to extremes and depths of carnality of which the lower animals are happily incapable. If the latter object were a part of the ends for which these endowments were given, the pursuit of it ought assuredly to bring good, and the abstinence from it ought to bring evil. That a precisely opposite course is the true way to avoid evil and secure good, proofs, amounting to demonstration, have already been presented. If more be needed to secure conviction, they will appear in sufficient number in the enumeration of the conse-

quences to which those who infringe the law of reproduction are liable.

CONSEQUENCES OF SOLITARY INDULGENCE.

A very striking way in which this law vindicates itself may be seen among those who practice solitary indulgence, which necessarily precludes the possibility of reproduction. It is only medical men who have any conception of the fearful prevalence and effects of this vice. It pervades all classes and conditions of society, making its way from youth to youth by the free and unclean tongues of school-boy Onans. The unguarded and unwarned hearer speedily tries the solitary vice, and, aided by the keen zest for pleasure during youthful days, soon carries himself to the verge of moral and physical ruin. An irreparable injury is inflicted, in this way, upon his nerves, bringing on in some instances great despondency, or epilepsy, or palsy of the lower limbs, protruding eyes, suicide, or idiocy. Like all unlawful enjoyments, the inclination grows with practice, until the will and faltering judgment are wholly unable to control it. Strange and unnatural sensations, fears, forebodings, and terrible fits of despondency gather around the transgressor. He imagines all sorts of improbable evils; when alone, his nerves are as if played upon by some evil spirit; no connected thought is possible; his sleep is disturbed by horrid dreams; all interest in ordinary occupations is lost; the appetite, flesh, strength, and energies wane; the

intellect enfeebles; and if the degrading habit is continued unabated it results in staring, stupid imbecility. It also tends to destroy all the finer and nobler sensibilities, to render the purer form of love all but impossible, and subverts all desire to enter the married state. Sometimes nature, more merciful, simply deprives the transgressor of the ability to transgress, — an amount of punishment which the poor wretch oftentimes deems to be greater than he can bear, and so, with cowardly subservience to a passion, lays violent hands on his own life.

Even when the habit is kept within more moderate bounds, or corrected by a resolute will, more or less injury is felt all through life. Its most ordinary form is in some kind of nervous weakness, or in an undue excitability, and a premature failure of virility.

EFFECTS OF AN EXCESSIVE USE OF THE SEXUAL FUNCTION DURING MARRIED LIFE.

Perhaps the number is not small of those who think there is nothing wrong in an unlimited indulgence of the sexual propensity during married life. The marriage-vow seems to be taken as equivalent to the freest license, about which there need be no restraint. Yet, if there is any truth in the law in reference to the enjoyment of the means only when the end is possible, the necessity of the limitation of this indulgence during married life is clearly as great as for that of any other sensual pleasure.

A great majority of those constituting the most

highly civilized communities, act upon the belief that anything not forbidden by sacred or civil law is neither sinful nor wrong. They have not found cohabitation during pregnancy forbidden; nor have they ever had their attention drawn to the injury to health and organic development, which such a practice inflicts. Hence, a habitual yielding to inclination in this matter has determined their life-long behavior.

The infringement of this law in the married state does not produce in the husband any very serious disorder. Debility, aches, cramps, and a tendency to epileptic seizures, are sometimes seen as the effects of great excess. An evil of no small account is the steady growth of the sexual passion by habitual unrestraint. It is in this way, that what is known as libidinous blood is nursed as well among those who are strictly virtuous, in the ordinary meaning of the term, as among those who are promiscuous in their intercourse.

The wife and the offspring are the chief sufferers by the violation of this law among the married. Why this is so, may in part be accounted for by the following consideration. Among the animal kind it is the female which decides when the approaches of the male are allowable. When these are untimely, her instinctive prompting leads her to resist and protect herself with ferocious zeal. No one, at all acquainted with the remarkable wisdom nature invariably displays in all her operations, will doubt that the prohibition of all sexual intercourse among animals during the period of pregnancy must be for a wise

and good purpose. And, if it serves a wise and good purpose with them, why should an opposite course not serve an unwise and bad purpose with us? Our bodies are very much like theirs in structure and in function; and in the mode and laws that govern reproduction there is absolutely no difference. The mere fact that we possess the power to act otherwise than they do during that period, does not make it right. The mere fact that we can produce abortions, which they cannot do, does not make it right. By the fruits of an act may it be known.

Human beings having no instinctive promptings as to what is right and what is wrong, cohabitation, like many other points of the behavior, is left for reason or the will to determine; or, rather, as things now are, to unreason: for reason is neither consulted nor enlightened as to what is proper and allowable in the matter. Nature's rule, by instinct, makes it devolve upon the female to determine when the approaches of the male are allowable; and if the same thing devolves upon woman, and the duty is not performed, this may in part account for the fact that she suffers so much from this form of misconduct: or the one that does not do as nature and the condition of the body requires, becomes the responsible sufferer.

But some may say that she is helpless in the matter. No one dare approach her without consent before marriage; and why should man not be educated up to the point of doing the same after marriage? She is neither his slave, nor his property, nor

does the tie of marriage bind her to carry out any unnatural requirement.

But it is not natural nor necessary that woman should stand upon the defensive. Human beings are not governed by instinct, but by reason; and as man possesses this faculty in a higher degree than woman, he should be the better able to see the enormity of his conduct, and the great injury which he may thus be instrumental in inflicting, not only on his wife, but on his offspring.

Medical writers agree that one of the most common causes of the many forms of derangement to which woman is subject consists in excessive cohabitation. The diseases known as menorrhagia, dysmenorrhœa, leucorrhœa, amenorrhœa, abortions, prolapsus, chronic inflammations and ulcerations of the womb, with a yet greater variety of sympathetic nervous disorders, are some of the distressing forms of these derangements. The popular way of accounting for many of these ills is that they come from colds or from straining lifts. But if colds and great strain upon the parts in question develop such diseases, why are they not seen among the inferior animals? The climatic alternations they endure, the severe labor some of them are obliged to perform, ought to cause their ruin; or else, in popular phrase, "make them catch their deaths from cold." But, it may be answered, an animal differs from a human being, and is able to endure vastly more than the latter. True it is, there are differences between them, while it is equally true that the differences in liability to colds

and to injuries from exertion are of art, not of nature. In other words, human inability is not an original quality of the organization. Nature's work in man is not less perfectly performed than in the animal. His greater lack of perfection and of adaptation alone arises from frequent violations of natural law. The feeble woman in this way takes cold from every change, and suffers from prolapsus by every lift; while the strong one does neither, even although the causes may be applied in intensity a hundredfold greater. If women will make paper dolls of themselves, they must not blame the wind for blowing them over; if they will make their bodies as sensitive to changes from heat to cold as the thermometer, they must not blame the weather for their colds and catarrhs; if they will make themselves so tender as to be bruised by the slightest touch, it will not do to blame and rail at the rough world in which they live, but rather should they lament and seek to correct the folly which produced their lack of adaptation to the conditions amid which they must live.

Coition during pregnancy is one of the ways in which the predisposition is laid for that terrible disease in children, epilepsy. The unnatural excitement of the nervous system in the mother by such a cause, cannot operate otherwise than by inflicting injury upon the tender germ in her womb. This germ, it must be remembered, derives every quality it possesses from the parents, as well as every particle of matter of which it is composed. The old notion of anything like spontaneity in the develop-

ment of the qualities of a new being is at variance with all the latest facts and inductions concerning reproduction. And so is that of a creative fiat. The smallest organic cell, as well as the most complicated organism, in form and quality, is wholly dependent upon the laws of derivation. These laws are competent to explain, however subtle the ultimate process may be, the great diversities of human organization and character. Impressions from without, the emotions, conduct, and play of the organic processes within, are never alike from day to day, or from hour to hour; and it is from the aggregate of these in the parents, but especially of those in the mother immediately before and after conception, that the quality of the offspring is determined. Suppose, then, that there is every now and then an unnatural, excited, and exhaustive state of the nervous system produced in the mother by excessive cohabitation, is it any wonder that the child's nervous system, which derives its qualities from those of its parents, should take its peculiar stamp from that of the parent in whom it lives, moves, and has its being? In the adult, epilepsy is frequently developed by excessive venery; and the child born with such a predisposition will be exceedingly liable to the disease during its early years, when the nervous system is notoriously prone to deranged action from very slight disturbing causes.

The infringement of this law regulating intercourse during pregnancy also reacts injuriously upon the mental capacity of the child, tending to give it a

stupid, animalized look; and, there is also good reason to believe, aids in developing the idiotic condition. Females whose health is in a weak state, especially from the violation of the first and second laws and from the drain upon the blood during the nursing period, become liable in transgressing this one to an infectious disorder, which, it is commonly supposed, can only originate or prevail among disreputable characters. But Dr. Bumstead, as well as some other eminent authorities, believe and teach that gonorrhœa may originate among women entirely virtuous in the ordinary sense of the term. That excessive venery is the chief cause that originates this peculiar form of inflammation, has long been the settled opinion of medical men.

EFFECTS OF PROMISCUOUS COHABITATION.

Every one is aware that those who indulge the venereal appetite promiscuously are liable to some terrible forms of disease. Considered in all their phases, these forms of disease are undoubtedly the most fearful which can befall a human being.

Syphilis, in its worst forms, is not only loathsome, but often as enduring as life itself,—tainting every drop of blood, every organ and function of the body, deforming the person, and branding the offender as well as his children with ineffaceable marks. Prof. Bumstead, with much experience in the treatment of this disease, says "that he never after treatment, however prolonged, promises certain immunity for

the future."* Quite frequently those who think themselves cured find the disease reappearing after a lapse of ten or even twenty years.

A striking peculiarity of this disease is that it afflicts the mind with a very persistent gloom and despondency. Sometimes this ends in insanity, but more frequently it leads the victim to seek to smother his morbid feelings with rum, or else to end his misery in suicide. Hundreds of the examples chronicled in the daily press as cases of mysterious suicide are really due to the persistent melancholy which this disease induces. Could young men be made to realize, even to an imperfect degree, the terrible punishments in store for those who infringe this law of their being, they would more frequently hesitate and turn their faces away from a sin, the consequences of which have frequently led sufferers to exclaim, "This is indeed a hell upon earth!"

Nor does the punishment cease with the transgressor. The offspring of parents who have had the disease are almost sure to inherit it or its indications in some form or other. Some syphilitic children even carry with them through life the ineffaceable traces of parental sin. The practiced eye can tell at a glance those who have had this taint deeply implanted in their blood, by a peculiar form of the front teeth. The eyesight of thousands of unoffending ones is also destroyed by syphilis; the bones sometimes become terribly diseased, the skin affected with scrofu-

* On Venereal Disease, p. 467.

lous sores, and the growth of the body dwarfed and puny, with the chances of being cut off in adult life by consumption.

The constitution of the body derived from parents with the syphilitic taint is never pure and strong. It either manifests weakness and imperfection by actual disease, or by a peculiar susceptibility to it,—making life, save with the greatest care, one of anxiety, derangement, and suffering.

EFFECTS OF ABORTION.

The ability to interfere with the course of the law of reproduction is a power possessed only by human beings. They can act in this, as in many other things, in conformity with law, and reproduce their kind, or they can break the law by laying violent hands upon the germ through which the law is carried into effect. Of course those who do so act upon the principle of enjoying the means without the end; thus reversing the invariable order or plan of nature in reference to sensual enjoyment. The extent to which this is done justifies the charge that man is practically the most sensual of beings.

The practice of producing criminal abortions is far from being confined to the most degraded of our race. In every station of life—among the wealthy, among professed Christians, and among the educated, even more than among the poor and ignorant—are systematic and successful efforts made to destroy the lives of unborn children. This is seemingly done

without a proper realization of its sinfulness, or of the moral degradation which it evinces. Dr. Storer aptly gave his book on this subject the title which expresses the ordinary answer of females to remonstrances against its performance—"*Why Not?*" The response indicates, in the clearest manner, the radical defects of the existing system of moral and religious instruction. Does any sane, respectable person answer remonstrances against the commission of theft or of murder with—"Why Not?" Yet this very thing of criminal abortion means, in plain terms, the most cowardly, base kind of murdering: cowardly, because upon a helpless, living embryo, to hide the result of sensual gratification, or to evade the duty of caring for it afterwards; or simply, with some, because it is thought to be vulgar to have children: base in a deliberate purpose to sacrifice life, moral purity, maternal nobility, and loveliness to degrading desire.

There are those who would fain make light of this crime by attempting to convince themselves and others that a child, while in embryo, has only a sort of vegetative life, not yet endowed with thought, and the ability to maintain an independent existence. If such a monstrous philosophy as this presents any justification for such an act, then the killing of a newly-born infant, or of an idiot, may be likewise justified. The destruction of the life of an unborn human being, for the reason that it is small, feeble, and innocently helpless, rather aggravates than palliates the crime. Every act of this kind, with its jus-

tification, is obviously akin to that savage philosophy which accounts it a matter of no moment, or rather a duty, to destroy feeble infants, or old, helpless fathers and mothers.

Perhaps only medical men will credit the assertion that the frequency of this form of destroying human life exceeds all others by at least fifty per cent., and that not more than one in a thousand of the guilty parties receive any punishment by the hand of civil law. But there is a surer mode of punishment for the guilty mother, in the self-executing laws of nature. This, in the majority of instances, is sufficiently severe, —far more so than any ever planned and executed by the hand of man. The punishment is often capital, or by death, as every physician has witnessed, and as the newspapers of the day abundantly testify. When not so, there is usually a life-long retribution in store for them, with an untimely and agonizing mode of death.

Yearly, thousands of women, wives and mothers in the higher walks of life, risk, or actually sacrifice, their lives by this unnatural crime,—their most intimate friends uninformed and unsuspicious as to the real cause of their death.

The means through which abortions are effected are various. Sometimes it is through potent drugs, extensively advertised in newspapers claiming to be moral !—the advertisements so adroitly worded as to convey under a caution the precise information required of the liability of the drug to produce miscarriages. Sometimes the information is conveyed

through secret circulars; but more commonly the deed is consummated by professed abortionists, who advertise themselves as such through innuendo, or through gaining this kind of repute by the frequent commission of the act. Not a few women, deterred by lingering modesty or some sense of shame, attempt and execute it upon themselves, and then volunteer to instruct and encourage others to go and do likewise. To the honor of regularly-educated medical men be it said, that, as a rule, they keep their hands clean of this matter. Indeed, to the medical profession is due the present awakening towards a rightful public sentiment upon this subject, and more especially to the able prize essay of Dr. Storer, published under the auspices of the American Medical Association, under the title of "Why Not?"

But medical men alone are incapable of arresting this evil, or of preventing thousands of women from thronging drug-stores for the purchase of somebody's periodical pills, or of hindering them from corresponding with some unscrupulous quack upon the subject. Besides, the public are not disposed to acknowledge physicians as authoritative promulgators of what is morally right or wrong. Their statements may be accepted as to the dangers of the practice; but too often this is done with little effect, for the majority of those applying for such a purpose are eager to incur *all the risks.* The truth is, that, when woman's conscience, modesty, and native delicacy are once scarred by constantly harboring the thought of it, there is nothing to restrain her from secretly

availing herself of the means. It is, therefore, a matter for rejoicing that many of the occupants of pulpits throughout the land have had the courage to address their hearers upon the moral degradation and the terrible sinfulness of criminal abortions.

The usual effects to the mother are either immediate death, permanently deranged health, or in laying the foundation for some incurable malady in the future. Upon the first, Ovid long ago wrote:

> "But righteous vengeance oft their crimes pursue,
> And they are lost themselves who would their children lose;
> The poisonous drugs with mortal juices fill
> Their veins; and, undesigned, themselves they kill,—
> Themselves upon the bier are breathless borne,
> With hair tied up which was in ringlets worn."

The death-rate from deliveries at the full period is very small, less than one per cent.; while that from abortions is very much greater, not less than fifteen per cent.,—how much more will never be known, as the motives for concealing death from this cause are very influential. When the subject of an abortion escapes immediate death, some form of womb disease is almost certain sooner or later to be displayed. The few who escape immediate disease or immediate death may deem themselves especially fortunate, and thank the uncommon vigor of their constitutions for the ability to endure such violence. Such a favorable result is, however, exceptional. The great majority of those who submit to this crime drag through life in miserable health, victims to painful irregularities, to slow and obstinate irritations, or to

a predisposition of the maltreated parts to take on disease from the slightest exposure and exertion. Frequently the constitutional shock is so severe that the strength is never fully recovered, the victim presenting a striking and permanent absence of all the marks of health and vigor. Even in some instances in which the transgressor flatters herself that she is uninjured, there is an insidious and terrible disease forming in the generative organs, which only awaits the waning of the general strength and energies to burst forth into torturing and incurable activity. I allude to that fearful disease, cancer of the womb,—a disease which, Dr. Storer states, has for one of its most ordinary causes the impaired vitality arising from the production of abortions. The injury and irritation produced in the womb by this violence are long held back by the strong vitality which prevails at the prime of life; but as soon as this vigor commences to decline, or about the fortieth year, the disease grows as the energies fail,—the cancerous fangs penetrating deeper and deeper, until, after excruciating suffering, the writhing victim is yielded up to its terrible embrace.

Such are some of the punishments for the transgression of this law, or for the cohabitation of the sexes for purposes other than those ordained by the great *Law-Maker*, and for successful attempts to evade his law for the increase and perpetuation of our race.

MODE OF OBSERVING THE FIFTH LAW.

Few natural laws have punishments, and no civil law has penalties, equal in severity and duration to the visitations upon the transgressor of this one. As before remarked, though man is the only being scourged by a host of sexual infirmities and diseases, there is yet no clear and general recognition that such a peculiarity is the legitimate consequence of his ignorance of, and disobedience to, organic law. This should not be a matter for surprise, when it is considered that, excepting the rite of marriage, no law is supposed to exist intended to regulate the demeanor of the sexes towards each other. At least, when the demands of civil law are complied with, men and women deem themselves, and are deemed by others, to have imposed all the restraint upon their carnal nature necessary to fill the ends of right and of law. Consequently, when evils, in the form of diseases, make their appearance in the organs devoted to the generative function, these diseases are not perceived to be the consequence of any special form of unlawful behavior. On the contrary, they are usually supposed to be inflictions sent in some way by an overruling power and for the spiritual well-being of the victim. No supposition is further from the truth, nor more subversive of that sense of responsibility

which leads to a pure and correct deportment. So long as this continues to be the prevailing sentiment, so long will mankind stumble on in the old way, living as they ought not to live, doing what they ought not to do, suffering as they ought not to suffer, and dying as they ought not to die.

Experience, it is true, does not warrant the hope that as soon as mankind are duly impressed with what is their duty in regard to the law regulating reproduction, they will immediately give a faithful and cheerful obedience to its requirements. No conquest in the restraint of an animal pleasure was ever made in this summary manner. Where there has long been anarchy, the mere framing of wise laws will not insure to them immediate respect and cheerful acquiescence. The practice of cannibalism was never suddenly abolished by law, nor has law been able to effect this with spirit-drinking or with opium-eating. But this by no means proves that laws appropriate for these offenses are useless. On the contrary, they are the chief means of educating men up to their standard, and, finally, of carrying them to a point of behavior in which the enactment of some laws is no longer required, as of that, for instance, forbidding the practice of cannibalism.

But this comparison of the usefulness and tendency of civil law with natural or organic law, does the latter injustice. There is always great opposition, and a display of passion and prejudice against human more than there is against natural law. In fact, there is nothing in natural law especially calculated to arouse

any of these emotions. The great obstacle in the way of a natural law exercising an immediate and controlling power over the conduct, lies in the difficulty with which its claim as a law is apprehended and the results which flow from it are recognized. Men are slow to believe in a new rule of conduct which opposes their habits or their inclinations; though, when once convinced of its reality, either by reflection, observation, or dear experience, it is more likely to influence the behavior than any merely civil enactment. Its justice and wisdom they cannot dispute, and the punishments which its infringement brings are far more certain and inflexible than those of any laws enacted and executed by human instrumentality.

AGE APPROPRIATE FOR THE REPRODUCTIVE ACT.

The time of life at which it is proper to exercise the sexual function is from the twentieth to the fiftieth year. Experience and the analogy of nature alike indicate that reproduction should not be attempted until the growth of the body is completed. If it is, the effect is not only unfavorable upon the offspring, but it tends to exhaust the energies and produce untimely impotence. It is a fact of some significance in this connection that some of the animal species die immediately after the reproductive act. The process is undoubtedly the most exhausting of all the animal functions, and should, therefore, not be attempted by those whose bodies are immature, or who are prostrated by disease of any kind.

IS ENTIRE CONTINENCE PROPER?

It is a question with some, whether total abstinence from sexual indulgence is compatible with a healthy state of the body. Of this there can be no doubt. Medical men are aware of no disease, or of a tendency to any disease, as a result of continence. It is true that vital statistics prove that the average duration of life is greater, the world over, among the married than the single. But this is probably due to other causes than the one under consideration. As a rule, the habits, the associations, and the various modes of using the body are more uniform, temperate, and regular with the married than the unmarried,—conditions sufficient to account for a difference in longevity.

WHEN IT IS IMPROPER TO EXERCISE THE SEXUAL FUNCTION.

Every man, on assuming the duties of a husband, ought to understand and determine that the woman of his choice should not be a mere instrument for the gratification of his desires at all times. To regard and treat the wife in this manner is practically to degrade her to the position of a slave to his lusts,—a relic of savage behavior, which the civilization of the nineteenth century should at once and forever discard. During pregnancy the husband should religiously abstain from his wife, ever remembering that acting otherwise he is risking the development, the health, and even the life of those who are dear to him as life itself.

There is no doubt that, in the physiology and hygiene of reproduction, the practices of a polygamous community are superior to those of monogamous nations. There is not the same temptation to intercourse at improper times, and hence of producing bad effects upon the wife and offspring. It is well known that this, and the great mitigation of the social evil by the polygamous system, furnish the standard arguments for sustaining the practice.

In the relations of the wife to the husband, she ought to be mindful that she has responsibilities towards herself and her offspring, which should not be ignored. Nor should she forget that the most successful way to produce indifference and aversion on the part of the husband is to allow an unrestrained indulgence of the venereal passion.

In reference to any interference with the natural course of pregnancy, it is scarcely necessary to say that there should be none. The wife who is free from deformity incurs a risk to her health and life by an abortion, a hundredfold greater than by delivery at the full period. There is not the slightest doubt about this: so let her never harbor the thought of submitting to a practice so criminal, so degrading and so dangerous.

SIXTH LAW.

A HABITATION IN THE CLIMATE FOR WHICH THE CONSTITUTION OF THE BODY IS ADAPTED—VIOLATION AND RESULTS.

It is a significant fact that man lives and thrives in every part of the world. A consequence of this, many have taken to be, that he belongs indifferently to all climatic regions. The natives of one region are supposed to be able to change places with the natives of any other region without incurring any permanently bad effects. This opinion is also supported by a popular theory, that mankind are all of one blood, and hence are by nature equally indigenous to every part of the earth. Taking them as a whole, they unquestionably are so; taking a part of them as constituting a variety, and they are about as much bound to a region by climatic peculiarities as the beasts of the field. Indeed, were it not for their ability to secure, in a high degree, artificial protection, the influence of a climatic change from and to those of opposite character, would act upon them precisely in the same manner as it does upon the lower orders of animated beings.

It is somewhat difficult to realize the truth of this law, in the case of man, by the milder and less easily

appreciated effects of removals which only involve a slight climatic change. But, when this is great or extreme, the bad effects are developed with so much uniformity and prominence that the cause becomes unmistakably apparent. Still, the experienced observer can easily detect the effects of short removals either to the north or south, or to a different altitude, and more rarely, of a removal from, or to, the east or west. The man who changes his place of living more than five or six degrees north or south, rarely escapes some departure from his accustomed healthfulness. The change acts upon him like some element of discord; his peculiar organization, or the mode of action of his body, no longer being in exact harmony with the external conditions amid which it has been placed.

WHY A CHANGE OF CLIMATE IS SOMETIMES BENEFICIAL.

There often arises, from a great variety of causes, a lack of adaptation between climate, and some acquired weakness or unharmonious action of the body; and, when this is the case, a change of climate often acts in a very beneficial manner. The body seems to be thrown out of tune, so to speak, with the conditions to which it has, by a long period of time, been adapted. A removal to another climate, judiciously selected, acts beneficially by restoring the lost harmony, or by placing the body amid milder or more uniform conditions, suitable to its weak or diseased state. The change of climate which usually acts as

a disturbing or deranging agent in health often acts as a remedial one in disease; and thus it is, with a change of climate as with the action of medicines, what will benefit the sick will act injuriously upon the healthy.

NO RACE LONG SURVIVES AN EXTREME CLIMATIC CHANGE.

In spite of man's capability for some adjustment to new climatic conditions, the amount and intensity of the diseased condition to which such changes give rise advance with their extremes, until the natural continuance of life is no longer compatible with them. The learned Dr. Copland remarks, "that the natives of polar regions on the one hand, and of tropical countries on the other, possess it" (adaptation to climate) "in a much less remarkable degree, and not only are they speedily cut off by removal from one climate to the other, but they suffer greatly from a residence in temperate countries."* He further remarks, "that the native African brought immediately to England is seldom able to live over one winter in it." Dr. Aitkin, Professor of Pathology in the Army Medical School (England), says, "When an Englishman is placed in the most beautiful part of Bengal, or Jamaica, where malaria does not exist, although he may be subjected to no attack of acute disease, but may live with a tolerable degree of health his threescore years and ten, he nevertheless ceases

* Dictionary of Practical Medicine, vol. i. p. 404.

to be the same healthy individual he once was; and moreover, his descendants degenerate. He complains bitterly of the heat, and becomes tanned, his plump plethoric frame becomes attenuated, his blood loses fibrin and red globules, both mind and body become sluggish, gray hairs and other marks show that old age has come on prematurely; the man of forty looks like one of fifty years old, the average duration of life is shortened (as shown in life insurance tables), and the race in time would be exterminated if cut off from fresh supplies of emigrants from the home country. The European in the Antilles *struggles with existence*,—a prey to fever and dysentery. He is unequal to all labor, becomes wasted and wan, and finally perishes. His decay is premature, and, but for the constant influx of fresh European blood, he would become rapidly extinct as a race. The European inhabitants of Jamaica, of Cuba, of Hispaniola, of the Windward and Leeward Islands, have made no progress since their first establishment there; they cannot execute labor, hence the necessity for preserving and maintaining the black population. Their offspring are pale, wan, and sickly, and in half a century cease to be productive. Our army medical historians tell us that European troops *do not become acclimated* in India. Length of residence in a distant land affords no immunity from the diseases of its climate, which act with redoubled energy on the stranger from the temperate zones. . . Although the constitution of the man may be so modified that comparative health may be re-

tained, yet there is a *morbid degradation* of the physical and intellectual constitution."*

A late surgeon of the British army in Bengal, Dr. Martin, says of the Europeans there, "that in no instance, so far as I am aware, has three successive generations of the pure European race been known to survive."

Dr. Bowdin, long a resident of Algeria, has confirmed this same rule of extinction among the French colonists there.

There is a reluctance among mankind to admit the full import of these facts. They seem inclined to think it to be as they wish, their race rising above the common external influences to which all forms of life below them are subject.

ACCLIMATING: ITS NATURE AND DURATION.

The term acclimating men commonly take to mean attacks of unusual forms of illness which take place immediately or shortly after removal to a new country. Such a thing as the so-called acclimating process, extending into the first, second, and third generations before it is fully accomplished, is not commonly entertained. That it does, and even beyond this limit, there is little room to doubt. It has been shown that in an extreme climatic change, as of the European removing to India or to Algeria, commonly but two or three generations are required

* Science and Practice of Medicine, vol. ii. p. 1016.

until the race becomes extinct; that is, the constitution of the European struggles that long with conditions unfavorable to his existence. Now, is it not reasonable to suppose that when the change is less extreme the struggle will be milder and more protracted, because not so quickly decided by extermination? It is so with plants and grains which man attempts to cultivate in regions unsuitable to their nature. They live on for year after year, but are never thrifty; they are liable to disease, to barrenness, and a dwarfed scragginess, which renders them difficult to recognize as belonging to the same species as those growing in their native clime.

But if the climatic and other conditions are more suitable to their nature, although they may not be as thrifty and healthy as in their native soil, they yet display a considerable degree of vigor, are fruitful, and finally, after a long period, their natures become harmonized to their new conditions. Almost a like grade of disorders and changes happen to the human race by a like cause. Thus, by a removal to the zone most unsuitable to the constitution of the body, the tendency is to disease, degeneracy, and death; by a removal to a zone less unsuitable, the tendency is to disease of milder character, which may with care, after the constitution of the body becomes more harmonized to its new conditions, entirely disappear; and so end in adaptation.

Now, this harmonizing of the body to new conditions is a slow and tedious process. No one supposes that the typical American, the typical Irishman,

Frenchman, and German were formed in one or two generations, but that it took at least more than these to produce a physical mould that may be recognized at a glance. The element of time is not less requisite in working a change in the constitution of the human body so profound as to bring it into harmony with new climatic conditions. It may be reasonably inferred from these considerations that those who migrate to climates somewhat different from that to which the constitution of the body is adapted, will not attain the greatest freedom from disease, so far at least as climate is concerned, until after the lapse of several generations.

There are other circumstances, however, which play a very important part in determining whether persons will or will not suffer, or succumb to the milder changes of climate. These are the degree of obedience and of disobedience rendered to the other laws of health, whereby the vigor and strength of the constitution are well preserved or badly impaired. If impaired, the body becomes subject to external conditions above which it previously soared, as has often been witnessed among those who, from the debility engendered by an attack of diarrhœa, of fever, or of indigestion, become for the first time victims to ague.

The climatic differences of a change of altitude usually affect the health unfavorably in proportion to the range traversed. Thus, the Indian tribes that have long inhabited the elevated regions of the Andes do not well endure a removal to the depressed

plains of Quito or Peru. A like inability to preserve health has been observed to occur to the native Himalayan when removed to the plains of India.

But it is not alone the differences of temperature and of atmospheric weight between an elevated and a depressed region that affect the migrants from one to the other unfavorably. The moisture of the air and the dampness of the soil—qualities often of great inequality at relatively small distances—have important influences. The Hollander, whose house rests on piles, its cemented basement sunk below an oozy surface, enjoys a degree of health which some on more elevated regions might well envy. A writer in *London Society*, speaking of the city of Amsterdam, remarks, "When it is considered that a vast population has been living there for many centuries, and that all below is simply one huge cess-pool, which cannot be effectually cleansed or emptied, the wonder is that any one can live there at all. And yet the place is by no means unhealthy for the natives who are acclimatized. Amsterdamers, indeed, boast with almost perfect truth that cholera has never visited them."

But it would be a great error to suppose that the prevailing good health of the Hollanders has any dependence on the abounding moisture amid which they live. The organization of their bodies, somewhat manifest by their peculiar physiques, has been adapted to their peculiar country, so that, when healthy or otherwise, the causes must be sought for in other conditions. But let another people not

habituated by ages of residence to such peculiar circumstances take up their abodes on the depressed plains of Holland, and they would soon become sufferers to an intense degree from conditions to which they were not adapted.

CLIMATE MODIFIES THE FORMS OF DISEASE.

The same law of health infringed, and in the same manner, does not always give rise to the same form of disease. The time of life, the season of the year, and the influence of climate, have each a modifying power. The respiration of impure air by children produces different diseases in them from what it does in adults. The former will have, in winter, tubercular meningitis, diphtheria, scrofula, croup, or peculiar forms of inflammation; in summer, cholera infantum and other summer complaints: the adult, consumption, rheumatism, typhus and typhoid fevers. The breathing of an intensely impure house air will not produce the same disease in the adult in Quebec as in New Orleans; the acute blood-poisoning, in the first locality, taking the typhus or typhoid type, in the second, the malignant-bilious or yellow fever type.

THE DISEASES WHICH A CHANGE OF CLIMATE TENDS TO PRODUCE.

When the natives of tropical regions migrate to the temperate zone, they are especially liable to be

cut off by aggravated forms of the diseases which prevail among the northern natives; just as, on the other hand, when the natives of the temperate zone migrate to the tropical, they are especially liable to be cut off by aggravated forms of the diseases which prevail among the southern natives.

During the late war, the negro troops of the Union armies mainly came from regions south of the scenes of their military operations. As a result, during the rigors of winter, which they were not adapted to endure, large numbers of them suffered and died from diseases of the respiratory organs. At Benton Barracks, Missouri, in about latitude thirty-nine, from January 1st to May 1st, 1864, there occurred among the six regiments of colored troops, seven hundred and eighty-four cases of pneumonia or inflammation of the lungs alone, of which one hundred and fifty-six died. Surgeon Russel, from whom these facts are gathered, says, "The greater liability of the negro to inflammatory pulmonary diseases is shown by the fact that, in an equal number of bodies examined after death of whites and negroes, a very much larger proportion of the latter are found to have old pleuritic adhesions than of the former."* He also states that he found the average weight of the lungs in the negro to be four ounces less than in the white man,—a difference that aids the mind in comprehending their lack of adaptation for enduring the rigors of the colder climes. Although the proportion of

* United States Sanitary Commission Memoirs.

white volunteers who were killed or died from their wounds in battle was more than double that of the colored, yet one out of seven of the latter lost their lives in the service, to one in fifteen of the former. The ratio of deaths per thousand from disease, among the white troops, was 59·22, while that of the colored troops was 141·39; so that, from data well known to the vital statistician, a large proportion of the colored soldiers must have been constantly on the sick-list. The main cause of this remarkable difference is to be found in the fact that the majority of the colored troops performed their duties in the field far north of the place of their nativity, and so, when exposed to extremes for which they were wholly unadapted, were cut off with pneumonia, pleurisy, and consumption. On the other hand, it is true that the whites performed their part far south of the place of their nativity, but the removal and great *exposure incident to a soldier's life* are very different in bad effects when made to a warmer instead of to a colder climate. A plant or an animal habituated to protection and then removed and exposed to all the changes of the weather far to the north of its native home, would meet a very different fate from a plant or an animal, similarly habituated, removed and exposed to all the changes of the weather far to the south of its native home. The one would be quickly destroyed, while the other would be likely to live on, at least for a considerable time. Like causes elucidate the difference of effects between human deportations to and exposure in the north, and deportations to and expo-

sure in the south. Is not such an explanation far more probable, to say the least, than that quoted by Dr. Dunster, from General Fry, that it arose from the mental state, or "lack of heart and hope,"* in the negro? Intimate observation and a just mode of inference tended to show and confirm the very opposite, viz., that their "heart and hope" was, and ought to have been, greater than ever before, with freedom, protection, honors, and preferment before them, where else had only been the task, the lash, and servitude.

Natives of cold regions, by migrating to warmer ones, become liable to diseases of the liver and bowels, and to intermittent, remittent, and yellow fevers. The more extreme the inadaptation by the rise of the isothermal lines traversed, the more extreme and malignant are the forms which these diseases assume.

Ague is comparatively rare among negroes,—so rare, indeed, that Prof. Dickson, formerly of Charleston, S. C., in his lectures, was in the habit of asking, "Who ever saw a negro with an ague-cake?" It is also quite as rare among the Indians of Florida, who live and thrive amid its marshes, where the white man is speedily cut off. This form of disease will be found to prevail only where there is either a lack of constitutional adaptation to climatic conditions, or where the strength of the system has been brought below par by some other form of transgression, so as to be more or less at the mercy of this variety of

* United States Sanitary Commission Memoirs.

untoward external influences. It is precisely as in the more northern regions; when the strength of any individual has been impaired by special causes, there is a peculiar susceptibility to changes of temperature, producing colds, coughs, and consumption; which changes, for many years, had been nearly or entirely harmless in their action upon the system. The special climatic conditions appertaining to any locality have thus an important, and, in many instances, a ruling power in determining the form which an unhealthy state of the body shall assume. Thus the civic poison of typhus in the north, develops yellow fever in the south, and the action of the chilling air on the body in winter, which produces coughs and lung-inflammations, will, when nightly periodical during the greatest heat of summer, produce periodical fever or ague.

Among the inhabitants of the temperate zone, their habits, their food, drink, rest, and sleep, differ but little the year round; yet the four seasons develop with as much regularity as spring does the grass, or summer the harvest, their special class of diseases, each in its season. The form of transgression and the form of bodily impairment belong to man; but in a large number of instances climatic peculiarities mould the impairment to this or that form of disease. The soft tenderness, the unnatural succumbing to outward forces, is solely the work of art; it is this that oftentimes renders the body inferior, and consequently the climate superior, to the vital energy of some part, or of the body as a whole.

MODE OF OBSERVING THE SIXTH LAW.

While physicians very generally concur in reference to the benefits the sick sometimes derive from a change of climate, the bearing of a like change upon the healthy has not received the attention it deserves. A change of climate sufficiently great to restore the sick must also operate in influencing health among the healthy. It will not, of course, be expected that a truly healthy person can be rendered more healthy by a change of climate, or that it would tend to preserve that of which there was not the slightest indication of losing.

A careful survey of the most available facts upon this subject warrants the conclusion that an imprudent change of climate more frequently destroys the health of the healthy than it cures the sickness of the sickly. It deserves to rank, as it does among medical men, as a therapeutical or curative agent of great power, —very proper sometimes for those in ill health, or threatened by it, but always injurious, or a disease-producing agent, to those in excellent health.

From various circumstances and motives, there has always been a greater preponderance of migration of robust men and women from the north to the south than from the south to the north,—a large share of whom, when the change has been a great

one, are swept off by diseases of the liver, congestive chills, or yellow fever. The likelihood of disease arising from a change of climate bears a direct relation to the extremeness of the change, and to the weakness of the vital force of the body. But even those of unexceptionable constitution will, sooner or later, succumb to profound climatic changes. As remarked, by Dr. Copland, of the English in the East Indies, "the vigor will rapidly deteriorate, until the race becomes extinct, in nearly every instance, in the third generation." When the climatic change is not so extreme, the disorders to which it gives rise are proportionately milder and less dangerous, and, with reasonable care, may end in complete adaptation.

HOW FAR ANY ONE MAY REMOVE TO THE NORTH OR SOUTH WITHOUT ENDANGERING HEALTH.

This law, strictly rendered, admits of only one interpretation, which is for the healthy to remain in the climate for which their race, by many ages of residence, has been adapted. This, of course, does not bind a race to one or two parallels of latitude or longitude, nor to a similar proximity to the sea. The more profound climatic changes, as in a removal from the coldest to the most torrid regions of the earth, exemplify in the most extreme manner the binding force of this law; the intermediate gradation of changes, as they become less and less, producing less and less disturbance, until their manifestations are no longer perceptible. How far any

one may remove to the north or to the south without deleterious results, is a question not capable of an accurate answer, as it depends very much upon the inborn force of the constitution. But, in general, all things being equal, a removal of more than ten degrees cannot be made without incurring ill effects. The element, in changes of climate the most influential over life, is heat and its irregularities. After it, are those of atmospheric moisture, and height above the level of the sea, or atmospheric rarity and density. A change of climate, even less than ten degrees, combining the three,—that is, an increase of heat, of atmospheric moisture, and of density, or of a change from a cool, dry, and elevated country to a low, warm, and moist one, or from a low, warm, and moist country to a cool, dry, and elevated one,—is almost certain to produce some disease. Still, unless these changes are united and extreme, within such a scope, as a rule, adaptation will finally occur.

A CHANGE OF RESIDENCE TO THE EAST OR WEST DOES NOT USUALLY AFFECT HEALTH.

A great change of longitude does not necessarily imply a great change of climate; though it is difficult to find any two localities, longitudinally far removed from each other, nearly alike in all climatic peculiarities. Distance from the sea, prevailing winds, proximity to mountains, the prevailing degree of atmospheric moisture, the severity of the seasons, and the disturbances of electric phenomena, are

never alike in all particulars, yet they are seldom sufficiently unlike to prevent complete adaptation.

RULES TO BE OBSERVED WHEN THE CHANGE OF CLIMATE IS GREAT.

Inasmuch as circumstances often require a residence in a climate for which there is not adaptation, it is well to bear in mind some general rules which will tend to guard against the invasion of disease. The foreigner should copy to the fullest extent the habits and modes of living, not plainly antagonistic to organic law, prevalent among the native inhabitants. In eating, in drinking, in times of exposure to heat and to cold, to day and to night air, and in variety of clothing, it is a safe rule to copy those of the natives. For the native of the temperate zone to carry with him to the torrid his beef- or pork-eating habit, his heavy style of clothing, his habitual use of rum or whisky, his custom of exposing himself to a noonday sun, is simply to invite and make certain the invasion of disease. Exposure to the extremes of day-heat and night-chilliness should be carefully avoided; the diet should be simple, light, and of native production, largely composed of acid and ripe fruits,—all spirituous drinks rigorously excluded, the relaxed skin invigorated by frequent baths, the sleeping-apartment as elevated as practicable, and every habit strictly temperate and uniform. Those removing from a southern to a more northern habitation should also copy the habits of

the natives not plainly inimical to health. A change of diet and of clothing is the most important; the former should be richer in fat, larger in the ratio of animal food than previously, and, upon the whole, greater in quantity; the latter should be more protective, abounding in wools and furs, and sufficient at all times to insure comfort. And, especially, should it be a care to guard against the instantaneous change from the highly-heated air of a house to the frigid air out of it. This sudden change serves, in a very active manner, in producing inflammations of the chest, which more than any other carry off those migrating from the south to the north. It is a much safer and better course to protect the body sufficiently in-doors as well as out, by clothing so warmly as not to create the necessity for a great difference between the temperature in a house and out of it.

SEVENTH LAW.

PURSUITS WHICH DO NOT CRAMP AND OVERSTRAIN ANY PART OF THE BODY, OR SUBJECT IT TO IRRITATING AND POISONOUS SUBSTANCES—VIOLATION AND RESULTS.

FREE and properly distributed action of all parts of the body conduces to its welfare. The tone and energy of the various organic parts can only be developed and preserved by appropriate use. Every muscle, nerve, and gland was made for a purpose, each in its appropriate manner, times, and periods. By thinking and attending to this, the balance and harmony of all the parts may be developed and maintained in that symmetry and unison which constitute the height and perfection of physical and mental existence. An occupation in which the arms are in constant use to the almost complete disuse of the legs, renders the one large and strong, the other small and feeble. Not being parts essential to life, the inequality detracts more from symmetry and beauty than health; but, when any of the more vital inward parts are subjected to a like usage, a like inequality of their strength and energy is slowly but surely produced.

Whenever an organ essential to life is to any great

degree made small and weak, the effect is to diminish the chances for health and long life.

The earliest pursuit which infringes this law is that of the pupil in the school-room. Compelled to sit for hours in a single posture, the sense of uneasy weariness is often inexpressibly painful. The muscles of the back are kept so long in continued action that the inclination to release them is almost irresistible. Then the soft and undeveloped bones of the spinal column, having to support the weight of the head and trunk in a position almost uniform for hours, suffer an impairment of nutrition, and become very liable to disease. The muscles of the extremities, kept inactive twenty-two out of each twenty-four hours, become small and weak; and girls, especially, when released from the long-continued constraint, have one class of muscles so wearied from over-action, and the others so weak from under-action, that there is a greater inclination to rest than to run about and play. The bones of the spine subjected to continued pressure frequently take on a slow form of ulceration, producing more or less crooking of that part,—a deformity exceedingly common among young girls not strong enough to resist such unnatural restraint.

EFFECTS OF CONSTRAINING OCCUPATIONS.

In shoemakers, tailors, seamstresses, watch-makers, engravers, etc., who sit for hours in a cramped position, the natural action and circulation of the

blood in the heart, lungs, liver, stomach, and bowels, suffer by serious impediment. Not only is the nutrition of these parts impaired, but the functions each has to perform for the general good are very imperfectly performed; and this, before long, will be certain to become a state of disease. The period of endurance which precedes disease depends upon the extremes and persistence of the infringement, and the inborn or resisting power of the body. The form of disease which the derangement assumes is likewise determined by inborn or acquired peculiarities, and by the incidental infringement of other laws. One will suffer from consumption, another from dyspepsia, another from liver-complaint, or costive bowels, piles, etc. It is a rare occurrence for any one who has long and closely applied himself to either of these occupations, not to show evidences of one or the other of these diseases. Indeed, the marks of incipient disease are foreshadowed in nearly all who have long and closely applied themselves to such constraining occupations. The pale and sallow face, and the rarity with which they can say that they are in the best and most buoyant states of health, are clear indications of disorder. Round and rosy tailors, shoemakers, and seamstresses are never seen. They have a permanent look of bad health, or as if they were under the influence of some potent drug. And as well might they be so, as to sit so long in a single bent position, deprived of wholesome air, sunlight, and exercise.

All other occupations requiring a like confinement

are alike injurious. Bending over a sewing-machine the whole day, and even for part of the night, will act in the same unfavorable way on health. Such persons would usually live longer, and have better health, under some out-door occupation, even if they were addicted to eating opium, arsenic, or other poison. A strong constitution resists the influence of these poisons a long time, and so does a strong constitution resist the bad influence of such constraining occupations. But succumb to the one as well as the other the constitution certainly will; and an abridgment of life is often clearly due to an ignorant, necessary, or willful way of using the body.

DISEASES RESULTING FROM GREAT MUSCULAR STRAIN.

Very severe exertion, as in running- or rowing-matches, jumping, and feats of lifting, is often productive of diseased conditions. Extraordinary strain is put upon the heart and blood-vessels, resulting in their enlargement, rupture, or in a permanent weakening of their structures; so that ever after, inconvenience or even great suffering is experienced from any unusual increase of their action.

Rupture or hernia is quite often produced in the same way, or by sudden and extraordinary efforts of strength, more especially in those of a lax and soft fibre, and who have not been habituated to severe exertion of any kind. Opticians, engravers, and glass-blowers, by putting an unnatural strain upon the eye, are peculiarly liable to derangements of

vision, such as inflammation, amaurosis, and cataract. Clergymen, actors, public singers and speakers, by the violent usage to which their vocal organs are at times subjected, frequently develop disease in these parts, as well as in the blood-vessels which connect the lungs and heart. Clergymen's sore throat, bronchitis, ruptured blood-vessels, and diseased heart-valves, are the most common of these effects.

DISEASES PRODUCED BY VARIOUS IRRITATING SUBSTANCES.

Steel-grinders, stone-cutters, and coal-diggers inhale large quantities of the fine and irritating dust peculiar to their occupations, and so become, in a very marked manner, liable to the development of disease in the lungs and bronchial tubes. Mr. Lanyon examined 270 miners in Cornwall, England, all of whom had worked at least ten years at coal-mining: 85 had cough, difficulty of breathing, or palpitation; 70 were subject to dyspepsia; 28 to chronic rheumatism; and 31 to other affections. Thirty-two of the whole number had bleeding from the lungs. Their average duration of life was thirty-one years, while that of the farming community in the same region was forty-seven years.

EFFECTS OF EXPOSURE TO POISONOUS SUBSTANCES.

Artisans who work in mercury and lead are well-known subjects to special forms of disease. Among the former, sloughing and mortification

about the mouth and in the jaw-bones, a peculiar trembling and dull aching pain over the whole system, with a bleached face and extraordinary susceptibility to cold, are the chief diseases to which they are subject. Among workmen in lead there prevail lead-colic, and lead-palsy, especially of the fore-arm, —diseases full of suffering and danger, as well as very obstinate in their resistance to curative measures.

The gases which collect in foul sewers, privies, wells, and in the various departments of manufacturing pursuits, are all more or less deleterious to those exposed to them. Some, like sulphuretted hydrogen, are intensely and speedily poisonous; others so impoverish the air which is inspired that the lungs are prevented from imbibing their proper quota of oxygen, producing lung and blood starvation. These effects are shown by pale blood and frequent attacks of lung disorder, without the evidence of any other sufficient cause. Offensive gases from putrid animal substances are deleterious in proportion to their abundance in the air inspired. From the fact that those exposed to them are not always or immediately made ill, superficial thinkers ridicule the idea of injurious consequences. Such fall into the error common to shortsighted persons of supposing an agent, not immediately operative in producing violent disease, harmless. As well suppose, because a man can drink rum or eat arsenic many years without bringing on disease, that rum and arsenic are harmless. Every form of putrid emanation, like a slow poison, gives rise to a rapid or a gradual struggle

with the vital energies to correct or to resist the fatal influence. The periods at which disease and death ensue depend on the strength or resisting force of the constitution, and the concentration of the gases inspired. A weakly person is liable under such circumstances to have his life quickly abridged, while the strong one may live on in tolerable health for years, but at last, by an attack of erysipelas, typhoid or putrid fever, have his life shortened ten or twenty years.

An overstrained brain is a very frequent cause of disease. By the excessive and prolonged action of the mind the brain centres in itself an undue share of nervous energy, and thus deprives other organs of their energy, to the great injury of their functions. Intense mental emotion also impairs or destroys the appetite and arrests the progress of digestion. Hence, students, ardent thinkers, and men overwhelmed with mental care and anxiety are very prone to dyspepsia, costiveness, and debility.

But the most disastrous effects are often manifested upon the mind itself. Brain inflammation and mental derangement or insanity are not unfrequent results. For many years the distinguished Sir Isaac Newton suffered in the last-mentioned way, and from that cause, and in more recent times, the brilliant intellect of Hugh Miller, fired to its utmost by a noble but over-earnest zeal, suddenly flashed into insane disorder, bringing about a sad and violent end by his own hands.

MODE OF OBSERVING THE SEVENTH LAW.

In the selection of an occupation for a lifetime its bearing upon health deserves the most serious consideration. Yet it is a point rarely considered. This could not well be otherwise, considering the general thoughtlessness and ignorance concerning the laws of health, and the consequent disregard of everything pertaining to its preservation.

Even men of mature years and experience, as well as those who often talk about the importance of living up to the laws of health, are commonly unable to say what these laws are, and, consequently, are incompetent to form an opinion when, or in what, they have or have not conformed. If such is the state of information among the better-informed, what must be the state of information among the young,—always over-confident and eager in their hopes and aims in life?

Inappropriateness of pursuits to constitutional peculiarities is unavoidable under such a state of things. The parent in selecting an occupation for his child is just as liable to select one the most certain to develop into disease and death some constitutional weakness, as to select one the least certain of doing so.

OCCUPATIONS TO BE AVOIDED BY THOSE PREDISPOSED TO DISEASE OF THE LUNGS AND BRAIN.

The workers in phosphorus, mercury, arsenical colors and paints, are among those the most exposed to agents destructive to health; while those who have adopted farming as their business are, perhaps, the least. For the weakly to select any of the former occupations would be almost sure to produce death in a few years; while for the strong, it would speedily lead to a struggle between the powers of life and of death, or, in other words, to a state of disease. The one who inherits a weakness in any organ of the body —and this can nearly always be ascertained by the family history — ought to avoid any pursuit which hinders the development and natural action of the weakly organ, or which tends to irritate, exhaust, or overwork it. Thus, one predisposed to insanity, or any other disease of the brain, should avoid any pursuit attended with great mental effort, anxiety, or harassing care. His occupation should partake far more of a physical than of a mental character; some simple mechanical pursuit, or that of farming. One with a predisposition to lung disease, especially consumption, should never select a confining or sedentary pursuit, such as that of book-keeping, watch-making, shoemaking, tailoring, or one which necessarily brings into the lungs irritating and poisonous matters, as in stone-cutting, coal-mining, steel-grinding, and milling; or one which brings him into crowded workshops and manufactories, where fumes, gases, and

other substances are diffused in the air which he has constantly to respire.

IMPROPER AVOCATIONS FOR THOSE PREDISPOSED TO DISEASES OF THE LIVER AND STOMACH.

Those predisposed to diseases of the liver and stomach should avoid selecting a pursuit which tends to restrain or to compress those parts; as in tailoring, shoemaking, watch-making, engraving, etc., or one of a sedentary nature. Muscular action is necessary for long-continued and good digestion, as it also is for the healthy action of the liver.

HOW TO CORRECT THE INJURIOUS TENDENCIES OF SOME PURSUITS.

The injurious constraint of many sedentary occupations can be measurably corrected by regular out-door exercise, or the exercise of those organs which have been kept cramped and quiet for hour after hour,—a mode of correction which far more frequently requires the will than the way. Those who have to sit nearly the whole day, can walk; those who walk can sit, and use their arms or brain; those whose daily labor has all been upon the brain, can relax the mind by duly exercising the body; those whose daily strain is all upon the body can release it by exercising or amusing the mind; those who have been in darkness must seek the sunlight; those who have strained the eye should amuse the ear: in short,

the parts in use for daily toil must be studiously relaxed, every morning and evening, by using all those parts not in use during the day, whether of eye, ear, hand, foot, voice, lung, or brain; and the parts subjected to the action of irritating or poisonous substances should be soothed by rest, and a return to the most favorable natural conditions.

The division of pursuits into the active, the sedentary, and the mental is doubtless necessary in order to acquire expertness and perfection of production, but it is ruinous to health when carried to extremes, as well as destructive to that harmony and complete development of mind and body requisite for a good organization. Thus, the farmer is large in outside muscle, sinew, and bone; while those engaged in lighter pursuits are small, quick, and nervous. The man of literary habits is turgid and active in brain, soft, thin, and weak in body. The farmer needs more time for body rest and brain culture; the artisan, diversity of exercises and intellectual culture; those of literary pursuits, less action of the brain and more of muscle. The leading object should be to unbend what has been rigidly bent for the day, and use that which has been unbent or the most inactive. Equalization in the use and play of all the energies and parts of the body is the law of action for health, as well as for the best and most enduring development of the entire man. A little reflection upon these principles will readily indicate to those engaged in any pursuit in what particulars they overstrain or overuse any part of their bodies, and in

what particulars they are compelled by their avocations to let others lie in idleness; and so enable them to perceive what to release and unbend and what to draw out and exercise.

Those of sedentary habits are apt to fall into the mistake that exercise is beneficial in proportion to its violence. In a general way, the benefit is all on the other side. Rowing-matches, boxing, foot-races, base-ball, and gymnastic exercises are almost always too severe; that is, they overstrain the energies of the body, and compel the duration of the exercise to be as short as it is excessive. Disease of the heart and blood-vessels is a frequent result of such violent pursuits; and, while I would not discourage the exhilaration of lively and emulous amusements, the maxim should always be borne in mind, never to allow them to be carried to the excess of completely exhausting the energies after a half-hour's or an hour's engagement in them.

METHODS FOR PREVENTING FLOATING PARTICLES OF MATTER FROM ENTERING THE LUNGS.

It is not practicable to lay down rules whereby irritating and poisonous substances can be prevented, under all circumstances, from injuriously affecting the body. For millers, stonemasons, and miners, a muzzle of cotton-wool, or damp crape, has been recommended as a protection to the lungs; for steel-grinders, a magnet to attract all the floating particles. But unquestionably the safest and easiest of applica-

tion is a strong or decided air-current, natural whenever it can be obtained, and artificial when not. As rapidly as the foreign particles or gases are formed by tools, machinery, or other process, they are thus swept away from the air drawn into the lungs.

PRECAUTIONS AGAINST LEAD AND MERCURIAL POISONING.

Workers in lead may avoid contamination by this poison through scrupulous cleanliness. Before each meal, and at the close of a day's labor, every vestige of lead should be removed from the pores of the skin on the hands and face; the mouth should be rinsed, and all the clothing contaminated by the poison removed from the person. The free use of fat meat and milk by workmen has proved of signal advantage in some lead establishments in preventing lead-poisoning. Lead-grinders should always wear a muzzle of cotton-wool as a protection to the lungs. The excellent experiments of Tyndall demonstrated the remarkable power of this substance for entangling small particles of invisible matter.

Sleeping in newly-painted rooms, especially if turpentine has been largely mixed with lead, should be avoided. The volatile nature of the former carries with it minute but dangerous quantities of lead into the lungs and blood.

The use of cheap *lead-glazed* earthenware for culinary purposes, soda-water from founts lined with lead or made of copper, and cosmetics, hair-dyes, and highly-colored confections, are often dangerous

from the abundance of lead or other poison they contain.

Water, especially when pure, conveyed in lead pipes speedily acquires poisonous qualities. It is a short but safe rule not to allow lead or copper, in any form, to come in contact with any drinks or food, or with the skin, or with the air which is inhaled.

Workers in mercury should observe the same rule of scrupulous cleanliness, and of removing their working-clothes as soon as the day's labor is over. The extremely volatile nature of this substance under heat renders thorough ventilation indispensable. A constant air-current, either natural or artificial, to sweep away the vaporized mercury, should be secured in every establishment. At the close of each day, workmen in this metal will secure additional protection by taking a teaspoonful of sulphur and ten grains of chlorate of potash in a little syrup.

EIGHTH LAW.

PERSONAL CLEANLINESS—VIOLATION AND RESULTS.

THE skin not only serves as a covering and shield to the tender inward parts, but it acts as an active porous tissue, giving out and taking in certain kinds of materials day and night. Each square inch contains upon an average twenty-eight thousand pores, or about seven millions for the entire surface. These in health are always active, throwing out not only a large quantity of water, but carbonic acid, and some old, useless matter, which, when retained, acts as a highly poisonous material. It is these ejected matters which assist in polluting the air of occupied rooms, and give cast-off clothing an offensive animal odor.

The skin is also an active absorbent, not only taking in liquids with which it may be in contact, but, in the place of the expelled carbonic acid, absorbing oxygen from the atmosphere. It thus acts as a co-laborer with the lungs in the performance of their functions, and so makes plain the origin of the intimate relation which every one is aware exists between the two.

A cruel experiment, which serves to show the importance of the action of the skin to life, has frequently been performed. The experiment consists in coating

the entire surface of an animal with some substance which prevents the escape of the exhalations from the skin, and the possibility of the absorption of oxygen from the atmosphere. The result uniformly is to cause the temperature of the animal's body to fall with great rapidity, bringing about its death in a few hours, after all the signs of intense distress.

Although the matters which collect on the skin of an unclean person, in the form of a soft scum or scurf, are not wholly impervious to air, or to the outward passage of carbonic acid, they yet hinder the escape of the noxious elements from within and the admission of the salubrious elements from without, and to such an extent as often to secure the development of disease. Such a result is more liable to occur when the lungs or the kidneys are not large and vigorous in action, and hence unable to perform, besides their own, the duties of a laggard skin.

But the mode of harm from an unclean and neglected skin is more than mechanical; it is vital. When the circulation of its blood and the action of its pores become sluggish and weak, and no longer able to perform their functions, various morbid states are certain to ensue. In all such cases, an increased and unnatural functional activity is thrown upon the lungs and kidneys, which increased action, if it does not result in acute disease of one or the other of these organs, at least tends to wear them out prematurely. The feebleness in the action of the skin engendered by uncleanliness also renders it liable after any unusual exposure to have its functions almost

wholly suspended, in which case a feverish state of the body quickly follows.

A FREQUENT CAUSE OF RHEUMATISM.

The very painful and obstinate disease, rheumatism, has no cause more frequent and influential in its development than an irregular or diminished exhalation from the skin. Among the products to which this organ gives passage from the blood, is lactic acid. A majority of the most able investigators into the nature of rheumatism are of the opinion that an over-abundance of that acid in the blood is the true cause of this disease. The kidneys and skin are its sole outlets from the body, and hence it follows that when from any cause the functions of the skin are partially or badly performed, the kidneys must either perform the work of both, or the acid must accumulate in the body. If the kidneys are large and act vigorously, this increase of duty may be temporarily performed without serious inconvenience; but when they are not, or when this increase of function is frequently put upon the kidneys, they, like an overtasked stomach, rebel, the injurious element is retained in the blood, and rheumatic fever is the result.

AN UNCLEAN, INACTIVE SKIN PREDISPOSES TO DISEASE.

Those who for month after month, and even for year after year, do not cleanse and invigorate the

skin by frequent baths, followed by brisk friction of the skin, lose the good offices of a very active organ of regeneration, and cause their blood to be in a state very favorable to the production of disease from slight causes. Exposure to any infectious disease, such as scarlet fever or measles, is more likely in those of impure blood to be followed by an attack, and a bruise, a cut, or an ordinary cold frequently assumes a very alarming severity or violence. The kidneys and lungs, in having to act as vicarious organs of elimination for several millions of delinquent pores, are also liable to become diseased from the increased duty put upon them, and for which they are naturally incapable. It is in this way that these organs frequently become the seat of pains, cramps, and inflammations; or exhausted, they fall below their natural activity, and cause the entire body to take upon it the work of expelling the hurtful agents, first effecting their decomposition by fever, and then throwing them out of the body after their reduction by the flames of disease.

MODE OF OBSERVING THE EIGHTH LAW.

Concerning the mode of observing this law little need be said. Not only the skin, but the clothing in contact with it, requires to be frequently and systematically washed. Nothing is more offensive to good taste than the practice of cleaning only those parts of the body or of the clothing exposed to view, leaving the incrusted and impure exhalations from the skin to offend and block up its outlets. It is not an unimportant matter for the preservation of health, to keep open and in vigorous action the millions of pores upon the surface of the body, and thereby give passage to large quantities of old, worn-out, and injurious matters from the blood.

HOW FREQUENTLY BATHS SHOULD BE TAKEN.

The beneficial effects of cleanliness, to be effective, must be systematic,—spasmodic efforts in this virtue effecting about as much good for the body as spasmodic efforts in temperate eating or drinking do for the stomach. Daily cleansing of the entire surface of the body is not any too often; and on no account, even during the winter season, when the secretions from the skin are at their lowest point, ought the intervals between general ablutions to exceed a week.

THE PROPER TEMPERATURE OF THE BATH.

For the healthy, the temperature of the bath should be neither cold nor hot,—not chilling the skin by the one nor relaxing it by the other. A prevailing notion with many persons is, that the sicker a medicine makes them, the more good it accomplishes; and with others of a religious turn, that the more they mortify the body, the more meritorious is their conduct; as it is with many that the more the body is shocked by chilling baths, the more effective are they as health-promoters. Very powerful impressions of any kind, as of great stimulation or great depression, can never become preservers of health in the healthy, whatever they may be as curative agents for the sickly.

With the idea of hardening infants, the cruel custom prevails with some parents of washing them in cold water. This should never be done by any prudent mother; the water for this purpose should be made only a little lower in temperature than that of the body.

BEST TIME FOR TAKING THE BATH.

The best time for taking a bath is in the morning. The body is then neither overheated by the noonday sun, nor exhausted by many hours of severe labor. Brisk friction of the skin with a flesh-brush or a Turkish towel promotes the activity and vigor of the excretory pores, and corrects in no small degree the liability to take cold by exposure.

All the clothing worn next the skin, it is scarcely necessary to say, requires to be frequently changed. The absorbed secretions from the surface soon render clothing impure, exhaling an effluvium the reverse of sanitary, not to speak of its extreme offensiveness. To know when clothing is impure, it is not necessary to see it: the peculiar effluvium will make itself known several feet from the body to the appropriate sense.

NINTH LAW.

TRANQUIL STATES OF THE MIND, AND ADEQUATE REST AND SLEEP—VIOLATION AND RESULTS.

A DISCONTENTED mind disturbs the healthy action of the body, and tends to induce a disordered state of the brain. The same is true of great and prolonged mental excitement, care, and anxiety.

The organization of our social system unfortunately tends, more and more, to promote such extreme and disturbed conditions of the mind. One class of men take the part of thinkers, schemers, or speculators; another, the part of actors or physical laborers: thus dividing among distinct parties occupations which should be united to a greater or less degree in one.

BAD EFFECTS OF AN EXCLUSIVE USE OF THE MIND.

The thinkers use to an excessive degree the powers of the nervous system, and neglect to use their muscles. The laborers use the muscles to an excessive degree, and neglect to use their brains. The former endeavor to bring out all the powers of an inner organ; the latter call into excessive exercise only the outer parts or the shell of their bodies. The excessive use of the muscles tends to weaken and benumb the brain, and the excessive use of the brain tends to

weaken and impair the muscles. In either case, if the oil of life, the blood, gives up nearly all its available strength to work a single part of the body, the others must suffer from lack of use, and so become unduly small and feeble.

The human body being a complicated organism, each part more or less dependent upon the way in which it is exercised for its proper development, it follows, that when only one part of it is exercised, the others must degenerate to a greater or less extent. The men, therefore, who use only the muscular part of their bodies tend to become more and more a mere mass or thick shell of muscles, with very low brain-power; while those who use only their brains tend to become more and more men with large heads and feeble, diminutive bodies. The tendency of both extremes is towards disease; in fact, they meet in this condition. The true rule for health and symmetrical strength lies in a temperate exercise of all parts of the body over which the will has control.

THE EFFECTS OF EXCITED AND DISTURBED STATES OF THE MIND.

Intense mental application, or intense feeling, after a meal, will arrest, or at least hinder very much, the digestive process, because it exhausts for the time the available nervous energies. This result has been proved by actual observation. In the celebrated case of St. Martin, whose stomach, in consequence of a wound, was left in a condition to allow the process of

digestion to be studied, it was seen when he became very angry that digestion was arrested,—the food passing quickly into the acid fermentation. The other functions of the body are liable to suffer in the same way. Every one is aware that great grief, joy, or mental excitement of any kind, effectually suspends the ordinary sensation of hunger. The healthy preparation of gastric juice, bile, urine, perspiration, and milk, by their appropriate organs, also depends greatly upon the energy received through *their* nerves derived from the brain. So powerful is this nervous influence under some extreme circumstances, as, for example, in the most intense forms of mental emotion, that the milk from the breasts of a nursing mother has been known to sicken, and in some few instances to kill, an infant.

The worry of business, the excitement, the prolonged and eager devotion, almost day and night, to money-making, to improvements, and to enterprises which so peculiarly characterize Americans, make them a nervous, a thin-fleshed, and a far from tranquil-minded people. Excitement becomes a necessity; they must live fast, even if they do not live long; and when one source of excitement fails, another must be found to take its place. They often feel the need, to an intense degree, of nervous stimulants to brace their flagging energies, or to take the place of the excitement formerly furnished by some business pursuit. The consequences are, of course, extremely unfavorable to health and the prolongation of life. Very many men, distinguished for their energy and success

in business, or for their literary attainments, by the continual wear upon their nerves exhaust the restorative powers prematurely, and are suddenly smitten, while in the prime of life, with apoplexy, paralysis, or some other disorder of the brain. The weakened and overworked brain, very appropriately, is the first to feel the shock of death. It is in this way that the mode in which thousands of men will die may be foretold with almost perfect certainty. The organ most misused is the one through which death begins its work.

In those of a more feeble organization, the prolonged excitement and worry of business soon prove too much for their strength. Appetite and digestion fail, the sleep is fitful or insufficient, and they soon become subject to severe headaches or distressing attacks of neuralgia. A constitutional weakness of any special organ of the body will be the first, under such circumstances, to display any very serious disorder. If this weakness is in the brain, the disorder may assume the form of melancholy or of insanity; if in the stomach, dyspepsia; if in the kidneys, diabetes.

EFFECTS OF INSUFFICIENT MUSCULAR REST.

The muscles and the brain alike need rest: the one in quietude, the other in sleep. When the muscles are not sufficiently rested, their endurance is diminished, their action liable to become tremulous, their substance affected with rheumatism; and if the in-

sufficiency be continued for many years, it results in bringing on all the marks of untimely decay, and the infirmities of old age.

An excessive and prolonged drain of energy from the internal organs to supply power for the muscles under the control of the will also affects these inward parts unfavorably. They are liable to be prematurely broken down, and to be affected by any form of disease to which there may be the least predisposition.

DISEASES PRODUCED BY INSUFFICIENT SLEEP.

Sleep is the great rejuvenator of the nervous energies, the winder-up of force in the nervous coils of the brain, which gives a good running-power for the day. Deprive the brain of the time required for the restoration of its energies, and there is experienced at first a dull, heavy, inert feeling, often accompanied by headache and a lifeless, unrested condition of the whole body. Continue this longer, and more serious evidences of mischief begin to be manifested. The state of the blood, the time of life, and the inherent strength or weakness of the nervous system, determine the nature of the mischief which prolonged lack of sufficient sleep brings on. In very young persons, convulsions, congestion, and acute inflammation of the brain are very likely to occur; but when the lack of sleep is not so great, but more protracted, the child either acquires a stupid, listless manner, or a very irritable, nervous one, bordering upon actual disease. Later in life, the deprivation of an adequate amount of sleep

keeping the brain in a state of forced activity, its tissues become redder than natural, and various uneasy sensations are felt in the head, of a dull, heavy character, bordering upon acute pain. Connected thought becomes almost impossible, and the entire body sympathizes and suffers by the lack of nervous tone. If yet further prolonged, the slight derangement passes into actual disease: in those with impure blood, into a low form of nervous fever with delirium ; and in those with pure blood, into acute insanity, congestion, and softening of the brain, or into an attack of apoplexy or paralysis.

A FREQUENT EXCITING CAUSE OF INSANITY.

A disposition to take far less sleep than ordinary, and this of a fitful character, is one of the earliest exciting causes and surest signs of insanity. The excitement or worry of business first acts as a disturbing agent, with careworn overworked sensations; then the very little sleep obtained causes no inconvenience, and the action of the brain gradually assumes the excited, over-active, and deranged condition characteristic of acute mania.

MODE OF OBSERVING THE NINTH LAW.

A uniform serene state of mind, neither liable to become intensely aroused by fierce outbursts of passion or to be carried headlong into a whirlpool of enthusiasm, nor to become intensely anxious and depressed over the cares of life, is a most rare and fortunate endowment. By all writers upon great longevity it is recognized as one of its most common causes, and deserves careful remembrance by all subject to extreme and profound emotions. Still, some enthusiasm, some moderate throbs of feeling, are not inimical to health. It is the intense and the prolonged that are so often seen to sap the strength, waste the body, and develop disease. Uncontrolled passions and corroding care should not, therefore, be allowed to assume control of the character, and destroy that cheerful and contented state of mind so essential to good health.

The control of all the emotional excesses is necessary to the physical, moral, and mental well-being of man; for, as great passion is a frequent producer of moral trouble, so is its excessive and prolonged influence, on the other hand, a frequent producer of organic disorder. In no country and among no people does greater moderation in the absorbing pursuits of life require more frequent remembrance and more practical enforcement than among the people of the United States. Intensity of action is their

leading quality. From infancy up, they hurry onwards, as if life were indeed a race, no time to think, no time to enjoy the present, but ever onward to the future,—the present nothing, the future everything. The energies of the blood are monopolized by this strain upon the nerves in keeping up the search after quick and keen enjoyment. And, when this or that anticipation fails, away on the wings of hope speeds the mind in quest of some new and fleeting phantom for to-morrow.

For health, as well as happiness, moderation and diversity of pursuits are essential requisites. To play all the while on one nerve, as upon one string of a harp, soon becomes wearisome and wears out responsive power. The pursuits of life should be as diversified as possible. When they are not, the exhibition of manhood must be partial, one-sided, or distorted. It is on account of this narrow one-sidedness that men often seek to ring strange variations, and to sound to the most extreme depths some one absorbing passion. When they have done this, they turn in disappointment at a limit so easily reached, and say that they are sick, disgusted, or sad in thinking that, after, all there is so little of enjoyment in life.

TRUE WAY OF PREVENTING A DISTURBED AND DISCONTENTED MIND.

There is no more effectual check to extremes, to great and sinful excesses of the conduct, or to murmuring disappointment, than a great diversity of pursuits. A wide and broad culture,—a culture

which embraces almost every form of exercise, a culture of the ear, eye, heart, and head,—which reaches out and grasps a share of knowledge and of pleasure in every branch of science and art, cannot be extreme in any. By deriving pleasure and advantage from many sources, there is no opportunity or necessity for excesses in any one. So many fountains of satisfaction are opened, that with a broad and uniform development of the entire man, the sensibilities do not tire as they are sure to do when they are solely fixed upon one or two objects for a lifetime.

WHAT CONSTITUTES ADEQUATE REST DURING THE FIRST TEN YEARS OF LIFE.

Sufficient rest for the body and mind during early childhood is a very important matter. The rule by which its sufficiency may be determined is a very plain one, which is, to allow little boys and girls all the time to rest they want. The intense natural desire for activity during childhood may assure the parent that rest will not be taken uselessly. The rigid system of some households, which makes young and old awake at the same hour, to work and sleep for the same period each day, is very injudicious, not to say cruel. The human body, young or old, is not a machine made to be run by any artificial system, but according to natural law. And natural law is very plain on one point: that youth is not the time to spend energy, but to accumulate it. Brains and bodies overworked in early youth do not turn out

well in after-life. The energy which should have been accumulated for a perfect manhood is frittered away in precocious display, when not destroyed by enfeebling disorder.

TIME TO BE DEVOTED TO THE DAILY EXERCISE OF THE MIND.

For those under ten years, not more than two hours of mental application should be exacted each day, and between ten and twenty years about double that time. In adult life few are able to endure over eight hours each day for any great length of time without bringing on bad consequences. This, however, depends very much upon the constitutional stamina,—some being able to endure without much fatigue double the time that others are. Yet it is a very unsafe practice with any one to see how much protracted labor his brain can perform. There are few who do not find, after a few hours' sedulous application, a dull listlessness, displacing their eager vigor, which is nothing more nor less than nature's warning to take some rest. Her warnings cannot be habitually disregarded with impunity.

The periods appropriate for daily physical labor are very nearly the same as those for the mental. A uniform expenditure of muscular power, usually cannot be made to exceed the hours devoted to the mental without severe fatigue. To exceed them, with the young, hinders the growth, malforms the body, and stupefies the mind; and with the adult, it wears out

the energies prematurely, and makes a man look and feel like sixty when only forty.

HOW LONG ADULTS SHOULD SLEEP.

During adult life, from a fourth to a third of each twenty-four hours is needed to recuperate the energies;—those performing great mental or physical labor, the longest, and those performing very little of either, the shortest. The physical laborer needs rest as well as sleep; but the mental laborer especially, requires a long period of sleep,—this being the only true form of rest for a severely taxed brain. In old age a return to the large share of time spent in sleep during infancy is the rule of nature; and when this rest is not taken, the lack of it becomes the main cause of the querulousness so often seen in the aged and infirm.

The proper time for sleep is of course during the night. With those who have an active occupation for the day, and not excessively addicted to the use of tea, coffee, wine, or tobacco, and whose digestion is not impaired, the question of how to get a good night's sleep, requires no consideration. In the case of those with weak digestion and sedentary habits, an early and very sparing supper only should be eaten, else the sleep will be troubled and unrefreshing.

Any wide deviation from these rules of rest and sleep cannot be tolerated for any great length of time without producing derangement in some form, except by those of extraordinary constitutional power.

As before remarked, the lack of adequate sleep is one of the earliest and most frequent signs of insanity,—doubtless playing an essential part in its development; and no one having either weak or strong nerves, should trifle with the natural requirements of so tender an organ as the brain. Even with the most tough and vigorous, the lack of rest will be sure to display some untoward effect as soon as the infirmities of age begin to creep on. No considerate person, therefore, will, simply because it is possible without present injury, infringe a law of his being; for it may be depended upon that a day of reckoning will finally come, in which the penalties for transgression will be rigorously exacted.

TENTH LAW.

NO INTERMARRIAGE OF NEAR BLOOD RELATIONS—VIOLATION AND RESULTS.

This law was recognized at an early part of the historic era. The decrees in Leviticus, the laws of Rome, and the Koran, forbade intermarriages among those near of kin. In all highly civilized nations of to-day its observance is enforced by civil enactments. There is, it is true, some difference of opinion and practice in reference to the nearness of relationship in which intermarriages are allowable; but none are so loose in these respects as there is evidence to show existed everywhere in the primitive state of our race, in allowing brothers and sisters, uncles and nieces, fathers and daughters, mothers and sons, to intermarry. This was the case in ancient Egypt and Persia; the latter requiring mothers and sons to unite for the production of persons eligible to certain religious offices. Half-blood marriages between brothers and sisters were allowed in Athens and Sparta, and among the ancient Jews. Abraham married his sister, his father's daughter, and Amram, the father of Moses, married his father's sister.

At the present time there is a fourfold barrier to the extreme infringement of this law,—the canons

of the church, the civil law, the general sentiment of disinclination, and the knowledge of the bad consequences likely to fall upon the progeny of incestuous unions. Nearly all the leading Christian churches and political dynasties prohibit marriages between those of the first, second, and third degrees of relationship, and some extend the prohibition even to the sixth and seventh. The sentiment of repugnance to close blood marriages is doubtless partly natural and partly acquired. As a rule, it seems as if attachments leading to the marital relation are more likely to spring up between those possessing dissimilarities in form, feature, and temperament than the opposite, as, for example, between the large and the small, the delicate and the coarse, the blonde and the brunette. It is rare to see a man and woman matrimonially united very like each other in any one strongly marked temperament or peculiarity of physique; but when it is, the offspring are seen to be puny and sickly, with the chances of being cut off in early childhood. That the repugnance to close blood alliances is not inborn, but sometimes superficial or wanting, or the mere result of education, is shown by the fact that a brother and sister far separated from each other in early life, and with no tokens in the memory of subsequent history, home, or name, when accidentally brought together during adolescence, are incapable of an instinctive discernment of their relationship, and may, as has happened, form an attachment for each other looking to, or actually consummating, the marriage rite.

The knowledge of the evil consequences likely to ensue to the progeny of those near of kin is, in a general way, far from definite, and consequently does not influence the behavior as it ought. Certainly, if true, and properly realized, no consideration ought to be more potential. What can be more dreadful and destructive to parental joy than the consciousness that one or more children are deaf, dumb, or idiotic through the sin of the father and mother? A profound impression of the likelihood of such a result would go far to prevent the emotions which lead to the consummation of the marriage relation.

That the intermarriage of those near of kin is likely to result injuriously to the offspring, does not admit of well-grounded doubt. It is true, some have questioned its truth; though what truth not absolutely self-evident has not been similarly questioned? Even at this moment there are those belonging to one of the learned professions, who deny the reality of the motions of the earth, without which the whole science of astronomy would be an absurd and baseless creation of the brain.

EFFECTS OF IN-AND-IN-BREEDING.

A favorite argument of those who affect to doubt the truth of the statistical evidence as to the injury likely to befall the children of close blood alliances is, that breeding in and in among domestic animals does not operate in deteriorating their offspring, as it is claimed to do among mankind. Indeed, this very

breeding in and in is the only way by which improved breeds are yet more improved and preserved, and the only way in which an apparently accidental variety can be perpetuated and increased. But the united testimony of experienced stock-breeders is, that prolonged in-and-in-breeding produces a delicacy of constitution, or, in other words, a lack of endurance, and a liability to disease from any trivial exciting cause.

WHY THE RULE FOR THE BEST ANIMAL REPRODUCTION DOES NOT APPLY TO HUMANS.

The inferences, however, to be drawn as to the good or evil effects of breeding in and in among animals and among mankind will not apply indifferently to each, because some of the antecedent conditions of the latter do not pertain to the former. The inherited constitutional taints and weakness of some one organ of the body more than another, which are all but universal among mankind, do not exist among animals; and as the antecedents are so fundamentally different, so must be the consequents. The crossing of qualities observed in the offspring of a male and female, when free from taint or weakness in any vital part, cannot, in accordance with the law of "like producing like," be expected to exhibit imperfections. On the contrary, within certain limits, close breeding among animals almost faultless, begets others less faultless, or, in other words, intensifies their superior qualities. But when the fibres of vitality are weak

or deficient in the same way, or in the same place, in the bodies of the male and female, as they so often are in the human family, the progeny of such a double inheritance ought, upon the same principles of reasoning, to exhibit an intensified weakness in the crossing lines, if the expression may be allowed, of the child. But when such imperfections of the male and female are *not* of the same kind, or in the same organ, the crossing fibres of vital perfection or imperfection, *not falling together*, or upon the same organ, the weak in the father is strengthened in the child by the strong in the mother, or the weak in the mother by the strong in the father.

WHY CLOSE BLOOD MARRIAGES AFFECT HUMAN OFFSPRING UNFAVORABLY.

It arises of necessity from these considerations that in intermarriages among those of the same blood, the constitutional taints or organic faults of the father and the mother must exist more or less in the same form and of the *same type;* and hence such defects fall upon their children with intensified force, and this the more markedly when the state of health in one or both parents, immediately prior to conception, favors the stamping upon the life of the progeny a more or less transient intensification of the constitutional imperfections. It is from this cause that the progeny of near blood alliances is affected so disastrously among mankind, and from its absence among animals that their offspring is not. When

it is remembered that there is probably not more than one family in fifty thousand free from constitutional taints or weaknesses of some sort, and that among those near of kin these constitutional imperfections must be more or less alike, for the offspring of such unions to display parental defects in an intensified form is in exact accordance with the law of reproducing perfections in the animal species. The lower animals, in being almost or wholly free from such constitutional imperfections, do not exhibit upon their progeny the defects of in-and-in-procreation, but their desirable developments by such a process are seen, within certain limits, to attain greater perfection. It follows from this course of reasoning that if mankind possessed organizations as pure and free from defects as those commonly possessed by the lower animals, close blood intermarriages would not tend to beget children who are victims to sad defects. At least, there does not appear any good reason, under such a state of things, why defects should be more common with the one than with the other, unless there may be causes for difference in the higher and more complex organization pertaining to mankind. Be this as it may, defective organizations in children do most certainly follow with great frequency from the marriage of those nearly related.

THE IMPERFECTIONS AND DISEASES ARISING FROM BLOOD INTERMARRIAGES.

Dr. Rilliet, of Geneva, communicated to the Academy of Medicine, that at that place "a considerable number of marriages take place between relatives; that attention has, during many years, been attracted to the unhappy consequences resulting from this circumstance, which affected the health and even the lives of the children. These consequences are—1st, absence of conception; 2d, retardation of conception; 3d, imperfect conception; 4th, imperfect offspring (monstrosities); 5th, offspring more especially liable to diseases of the nervous system, and, in order of frequency, epilepsy, imbecility, deaf-mutism, paralysis; 6th, lymphatic offspring, predisposed to the diseases which spring from the scrofulo-tuberculous diathesis; 7th, an offspring which dies at an early age in a larger proportion than children born under other circumstances; 8th, an offspring which, if it passes the first period of infancy, is less capable than others of resisting disease and death. To these rules there are exceptions, due either to the state of health of the progenitors or to the dynamic condition in which the parents happen to be at the time of connection."*

Dr. Bemiss, with pains-taking assiduity, collected a large mass of statistics bearing upon the evil effects to the offspring of intermarriages, which confirm the conclusions of Dr. Rilliet in the fullest manner. In

* American Journal of the Medical Sciences, October, 1856, p. 475.

his report before the American Medical Association in 1858, he gives 580 instances of cousins intermarrying, resulting in 2778 children, more than one-half of them strikingly defective in organization, and classified as follows: 117 deaf and dumb, 53 blind, 231 idiotic, 24 insane, 44 epileptic, 289 scrofulous, 53 deformed, and 637 died early.

From an interesting essay of Dr. Allen we cull the following statistics: Dr. Howe, in his report to the Legislature as to the causes of blindness, idiocy, etc., says that of seventeen families in whom the parents were blood-relations, 95 children were born to them, of whom 44 were idiots, and 12 others were scrofulous or puny. Six of the families had each one idiotic child, two had two, three had three, five had four, and one family had five idiots.

"In the city of Dublin Dr. Mulligan made observations in relation to 154 families, the heads of which were related as cousins: there were in this number 100 children deaf and dumb. In 34 families there were two in each; in 14, three in each; in 3, four in each; in one family, six; and in another family of thirteen children, seven were deaf and dumb.

"Dr. Buxton, of Liverpool, states in regard to 170 families thus related that in 109 each had one deaf and dumb child; in 38, two had such children; in 17, three; in 3, four; in 1, six; in 1, seven; and another, eight: making, in all, 269 children,—living monuments of a violated law of nature. In the French Academy of Sciences, where this subject was lately discussed, Dr. Anedon reported that in the small dis-

trict of Menorthe there were 54 such marriages, 14 of which were barren, while in 7 the issues died before reaching adult age; in 18, the children were attacked with various chronic diseases; and in only 15 were the offspring healthy.

"Dr. Cadiot states that out of 54 such marriages, 14 were barren, 7 produced children who all died before arriving at adult age, and 18 produced scrofulous, rickety, consumptive, deaf and dumb, or idiotic children."

Such facts, of which many more of like import might be adduced, are sufficient to show that, so long at least as mankind are tainted and faulty in organization, intermarriages among relations so near as cousins should be prohibited. The onerous duty of the State in caring for unfortunate beings with such arrested or diseased nervous developments, requires that it should protect itself, if not by legal enactments, then by an enlightened system of education, which will lead such marriages to be regarded as a sin, whose fruits are among the most sad and fearful that can befall a human being.

MODE OF OBSERVING THE TENTH LAW.

Concerning the observance of this law, the only point in doubt is the nearness of the relationship in which consanguine marriages are allowable. The dispute which has agitated some churches, whether a man may marry his wife's sister, not involving consanguinity, does not come within the scope of natural law. So, also, of cousins not german: there are no physiological considerations interfering with their matrimonial union.

If the premises heretofore laid down be correct, that the likelihood of evil manifestations upon the children of those near of kin, depends upon the sameness and degree of constitutional defects or of obliquities towards disease, it follows, that if adults near of kin had constitutions comparatively pure, strong, and symmetrical, they could intermarry without evil results to their children, or, at least, much closer than those of impure, weak, or unbalanced organizations. In other words, when the physical constitution of the male and female approaches perfection, the result upon the child is a nearer approach to perfection; and the more imperfect the parents, the greater the imperfections of the offspring. There being among mankind a very wide difference in constitutional perfections and imperfections, it follows that no

arbitrary line can be drawn over which it would be alike unsafe for all to step.

SOME CONDITIONS WHICH AFFECT CLOSE BLOOD INTER-MARRIAGES.

In forming a reliable judgment on this matter, everything depends upon the ability to form a correct opinion of what constitutes physical perfection. All realize that family history is one of the very best guides to what are the inherited defects, or tendencies to them, in any given case; but all do not realize that any extreme manifestation of one or two of the temperaments is also an evidence of faulty organization.

A symmetrical or well-balanced constitution has a happy blending of the temperaments,—the nervous, sanguine, bilious, and lymphatic. Those having the nervous temperament to an extreme degree are predisposed to convulsive diseases and to disorders of sensation; those of the sanguine, to congestions, inflammations, and hemorrhages; those of the bilious, to diseases of the stomach, liver, and bowels, and an associate condition,—hypochondria; those of the lymphatic, to affections of the glands, joints, and skin, and torpidity of the functions of the body as a whole. Uninterrupted health and great longevity are very seldom attained by any one having either temperament in an extreme degree: it is a mark of a faulty organization; and the procreation of a pair in whom the same extreme singleness of temperament is very prominent, never fails to affect the

offspring unfavorably. An instance of husband and wife not consanguinated occurs to mind, in whom the nervous temperament prevails to an unusually equable and extreme degree. The result upon the offspring is an intensification of the same temperament in the three living children, five others having perished in early infancy.

HOW DISTANT THE BLOOD-RELATIONSHIP SHOULD BE TO INTERMARRY.

Seeing that physical taints and imperfections are all but universal, the inference is that cousins german should not intermarry, and not even those having two or three removals more, when there are unmistakable marks of a temperament similarly extreme, or of any inherited imperfection in the organization of the body. But first-cousins may marry with impunity to their progeny when there is an even blending of the four temperaments, and when there is no family taint, no tendency to disease and to death save from old age, no predisposition to weak nerves, brain, lungs, liver, and stomach,—when, in short, the organization of each is perfect, or nearly so. A union of these conditions in the branches of any family is such a rare, such an extraordinary circumstance, that it amounts virtually to an entire prohibition.

In proportion as individual constitutions depart from the standard of physical perfection, should the remoteness, or more properly absence, of blood-rela-

tionship be consulted in seeking to form matrimonial alliances. The mere fact of blood-relations having temperaments strikingly dissimilar does not of itself afford any reliable security that no unhappy effects will arise to the offspring. The well-known principle of atavism, or of ancestral peculiarities reappearing after skipping a generation or two, subverts the security which a pair might feel, that their dissimilar temperaments guarantee a judicious cross for their children.

CONCLUSION.

It will not be denied that in the various modes in which men and women use their minds and bodies, no laws have any practical recognition. A man, it is usually thought, has an entire right to use himself as he pleases, so long as in doing so he does not trample on the rights of others or violate his obligations to his Creator. It has been my endeavor to show that he has no such right, and that because he has practically assumed it, is he subject to so much punishment,—is he such a pain-stricken, sickly, and short-lived being.

A necessary corollary from this deduction is, that if mankind knew and obeyed the laws of health they would be free from pain, disease, and untimely death. Such a holding of life and health at will is no Utopian conception. The obstacles to be overcome, and the improbability of such a result, are not so great as those which appeared to our forefathers

to stand in the way of an almost unlimited command, which is this day seen over the forces of nature, saying to them, "Do this," and it is done. It is only needful that man should direct all the powers of his intellect and the control of his will to enable him to accomplish as much for himself as he has accomplished with the forces of nature.

It is well known that old men are occasionally seen who have lived through a long life without an attack of sickness, and who have never felt the need of a physician. What is the common-sense explanation of this healthy longevity? It is that they have inherited good constitutions and taken good care of themselves; or in other words, with a good inheritance, they have been so circumstanced or inclined that they have not violated the laws of health to any great extent. And if this be an effect of an accidental obedience to these laws, what are we not warranted in concluding would be the result of an intelligent and intentional obedience?

It is true that the great majority of men and women have imperfect constitutions, which render them liable to more or less suffering and disease. But the very way to improve an imperfect constitution is to live, especially in early life, in conformity with the laws of health, as the very way to impair a good constitution is not to conform to these laws. This improvement and this impairment being transmissible qualities, it is within our power, by living as we ought to live, to have our children start in life on a higher and purer plane of vigorous life than we did, as it is also

within our power, by an opposite course, to have them start on a lower. Even with a very defective constitution, a strict compliance with all the laws of health will secure an immunity from disease truly wonderful, and, besides, protract life to a very desirable limit.

THE END.

IMPORTANT MEDICAL WORKS

RECENTLY PUBLISHED BY

J. B. LIPPINCOTT & CO.,

715 and 717 MARKET STREET, Philadelphia.

A New and Revised Edition of the United States Dispensatory. The DISPENSATORY OF THE UNITED STATES OF AMERICA. By GEORGE B. WOOD, M.D., and FRANKLIN BACHE, M.D. Thirteenth Edition. *Carefully Revised and Corrected, with Numerous Important Additions.* One Volume, Royal 8vo. Superfine paper. Sheep. $10.00.

Hand-Book of Operative Surgery. By John H. PACKARD, M.D., Sec. of the Coll. of Physicians of Phila., etc. With Fifty-four Steel Plates, and Numerous Illustrations on Wood. 8vo. Extra cloth. $5.00.

"Its distinguishing feature is abundant illustration, and in this respect it is unequaled by any hand-book with which we are acquainted. . . . To students and practitioners who have not the frequent opportunity of witnessing practical surgery, the volume before us will prove of unquestionable value."—*N. Y. Med. Record.*

Medical Diagnosis with Special Reference to Practical Medicine. A Guide to the Knowledge and Discrimination of Diseases. By J. M. DA COSTA, M.D. Illustrated with Engravings on Wood. *Third Edition, Revised and Enlarged.* 8vo. Fine cloth, $6.00; sheep, $7.00.

"To digest and memorize the matter of all its pages will well repay the labor it costs. It may be welcomed as a text-book which will do credit to our national medical literature."—*Amer. Jour. of Med. Sciences.*

A Compend of Materia Medica and Therapeutics. For the Use of Students. By JOHN C. RILEY, A.M., M.D., Prof. of Mat. Med. and Therap. in the Nat. Med. Coll., etc. 8vo. Extra cloth. $3.00.

"Prof. Riley has done his work very well. . . . The descriptions of the various articles of the Materia Medica are very concise and remarkably accurate."—*N. Y. Med. Journal.*

THE MEDICAL TIMES.

A SEMI-MONTHLY JOURNAL OF

Medical and Surgical Science.

The leading features of this Periodical, which is intended to supply an important want, and to subserve the growing intelligence of the Medical Profession, are as follows:

I. There is a department in each issue for Original Lectures, which are furnished by the most distinguished clinical teachers in this and other cities.

II. The space devoted to Original Communications in each number is large, and articles will be contributed to it by many of the most eminent American authors.

III. There is a department devoted to the publication of the records of Important Cases, and of brief summaries illustrating Hospital Practice.

IV. The Journal is open to the free and thorough discussion of all important questions relating to Medical Science, Hygiene, Medical Jurisprudence, Medical Education, Hospital Management, and kindred subjects.

V. Abstracts of the Transactions of Medical and Scientific Societies are furnished.

VI. In arranging the department of Foreign and Domestic Correspondence, care has been taken to secure frequent and full accounts of the progress of medicine, and of all important medical movements in the principal cities of the world.

VII. Short but careful Reviews of the more important medical publications form a feature.

VIII. Reports of recent Improvements, Discoveries, and Important Observations in all branches of Medical Science are furnished in each issue.

IX. Under the head of Medical Miscellany, an ample summary is presented of matters of general interest to the profession.

The Publishers are happy to be able to announce that among the regular contributors to this Journal are many of the most distinguished writers in the Medical Profession.

The MEDICAL TIMES is published on the 1st and 15th of each month, and contains Twenty Imperial 8vo pages, Illustrations being inserted when necessary for the elucidation of the subjects discussed.

YEARLY SUBSCRIPTION, $4.00, IN ADVANCE. SINGLE NUMBER, 20 CENTS.

J. B. LIPPINCOTT & CO., Publishers,

715 and 717 Market Street, Philadelphia.

DATE DUE

-9 APR '73 CLM

DEMCO 38-297

32.A.169.
The ten laws of health; or, How1872
Countway Library BDQ8451
3 2044 045 463 197

32.A.169.
The ten laws of health; or, How1872
Countway Library BDQ8451
3 2044 045 463 197